Meeting: 1001, Evanston, Illinois, SS 2A, Special Session on Extremal Combinatorics

1001-05-154 **Maria Axenovich*** (axenovic@math.iastate.edu), 400 Carver Hall, Ames, IA 50011. *On colored arithmetic progressions.*

Let $[n] = \{1, \ldots, n\}$ be colored. Under what conditions on the coloring are there monochromatic or totally multicolored arithmetic progressions of fixed length k? Szemerédi's theorem claims that it is sufficient to have one dense color class to have a monochromatic progression. We investigate the two natural conditions for the existence of totally multicolored progressions:

1. The size of the largest color class is bounded from above by $f(n, k)$.
2. The size of the smallest color class is bounded from below by $g(n, k)$ and the number of colors is fixed.

Among others, we determine the functions f and g exactly for $k = 3$ thus answering an old question of Alon et al. and proving a conjecture of Jungic.

This is a joint work with Dmitri Fon-Der-Flaass and Ryan Martin. (Received August 23, 2004)