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Michael Young* (myoung@iastate.edu). *Rainbow arithmetic progressions in the integers.*

A k -term arithmetic progression is a sequence of the form $a, a + d, a + 2d, \dots, a + (k - 1)d$, where a and d are nonnegative integers. Van der Waerden's Theorem states that given a set of colors there exists an interval $[1, n]$ such that any coloring of the integers, using all the colors, will contain a k -term arithmetic progression with each term having the same color. Given a set of colors and $k > 0$, actually determining n , called a *van der Waerden number* has proven to be a very challenging problem. In this talk, we will discuss some known results about van der Waerden numbers and introduce anti-van der Waerden numbers. An *anti-van der Waerden number* is the number of colors needed to guarantee that any coloring of the interval $[1, n]$ with all the colors must contain a k -term arithmetic progression with each term having a distinct color. (Received July 25, 2014)