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*Sharp threshold for van der Waerden's theorem*

It was shown by Rödl and Ruciński that for  $m = C_r n^{\frac{k-2}{k-1}}$  almost every  $m$ -element subset  $M$  of the first  $n$  integers has the property that every  $r$ -colouring of  $M$  yields a monochromatic arithmetic progression of length  $k$ , while sets of size  $o(n^{\frac{k-2}{k-1}})$  fail to have this property. We discuss sharp thresholds for this and related properties. This is joint work with E. Friedgut, H. Hàn, and Y. Person.