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**Bryna Kra\*** ([kra@math.northwestern.edu](mailto:kra@math.northwestern.edu)), Department of Mathematics, Northwestern University, 2033 Sheridan Road, Evanston, IL 60208. *Dynamics of integer sets.*

Van der Waerden proved that if you color the integers with finitely many colors, then at least one of the colors contains arithmetic progressions of arbitrary length. Szemerédi proved the beautiful density version of this theorem, showing that a set of integers with positive upper density contains arbitrarily long arithmetic progressions. A few years later, Furstenberg established the deep and surprising connection between combinatorics and ergodic theory, using ergodic theory to prove Szemerédi's Theorem. This development led to the field of Ergodic Ramsey Theory, and many new combinatorial and number theoretic statements have been proven using ergodic theory. This interaction continues today, with ergodic methods playing a role in Green and Tao's proof that the prime numbers contain arbitrarily long arithmetic progressions. I will give an overview of this interplay, with a focus on recent developments in ergodic theory. (Received August 30, 2006)