

1035-11-8

Terence Tao* (tao@math.ucla.edu), Department of Mathematics, UCLA, 405 Hilgard Ave, Los Angeles, CA 90095. *Structure and randomness in the prime numbers.*

Additive prime number theory - the study of additive patterns contained within the prime numbers - is an old subject, concerning such well-known open problems as the twin primes conjecture and the Goldbach conjecture. Intuitively, additive patterns should be numerous because the primes should be distributed "randomly" in an additive sense (after accounting for some obvious additive structure in the primes, such as the fact that they are almost all odd). However, quantifying this intuition has proven to be rather difficult. I will discuss some recent progress towards such questions (joint with Ben Green) in the case of additive patterns (such as arithmetic progressions) which have two or more degrees of freedom. The main sources of the progress are quantitative versions of methods and results from ergodic theory and dynamical systems. (Received May 20, 2007)