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Gowers uniformity of primes in arithmetic progressions

A celebrated theorem of Green-Tao asserts that the set of primes is Gowers uniform, allowing them to count asymptotically the number of k -term arithmetic progressions in primes up to a threshold. In this talk I will discuss results of this type for primes restricted to arithmetic progressions. These can be viewed as generalizations of the classical Bombieri-Vinogradov theorem. I will also discuss a number of applications; for example, the set of primes p obeying $\{\sqrt{2p^2}\} < 0.1$ exhibit bounded gaps. This is joint work with Joni Teravainen.