Waring-Goldbach Problem with Sparse Subsets of Primes

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Classical Waring-Goldbach problem concerns representability of all large integers satisfying a certain local condition as sums of fixed number of kth powers of prime numbers where $k \geq 1$. For instance Goldbach's conjecture states that every *even* number ≥ 4 can be expressed as a sum of two primes. Let $H(k)$ be the least integer s such that every sufficiently large positive integer subject to a certain condition may be expressed as a sum of s kth powers of primes. Following the pioneering work of Vinogradov (1937) (which yields $H(1) \leq 3$), Hua (1938-1959) showed that $H(k) \leq 2^k + 1$. He then reduced his bound to $H(k) \leq 4k \log k(1 + o(1))$ for every large k. In this talk, we shall first go over the proofs of upper bounds of Hua, and then look at Waring-Goldbach problem with primes chosen from sparse subsets of integers.