

1106-11-321 **Xiaoyu He*** (xiaoyuhe@college.harvard.edu), 282 Eliot House Mail Center, Cambridge, MA
02138. *Geometric Progression Free Sequences with Small Gaps.*

In this talk we prove the existence of geometric progression free sequences of natural numbers with small gaps, partially answering a question posed originally by Beiglböck et al. Using probabilistic methods we prove the existence of a sequence T not containing any 6-term geometric progressions with gaps of size $O(\exp(C \log x / \log \log x))$. Our approach requires certain elementary bounds on sums of arithmetic functions in short intervals. We will touch on related problems about arithmetic-progression free sequences and multiplicative number theory. (Received August 21, 2014)