Abstract:

For positive integers $d$ and $k$, let $m(d,k)$ be the maximum positive integer $m$ such that there exists a set $A$ of $k$ integers such that every integer is congruent to a sum of at most $d$ elements of $A$ modulo $m$. It is easy to see that $m(d,1)=d+1$ and $m(1,k)=k+1$. However, the computation of $m(d,k)$ in general is unexpectedly complex. It is still an open problem to have an exact formula for $m(2,k)$. In this talk, I will discuss the current development of this and other related problems, and prove a lower bound for $m(2,k)$. I will also discuss the computational aspects of this problem.