1:25 pm – 1:55 pm

On the critical numbers of a fixed finite abelian group $G$ only concerning its generating subsets

James Arps

A subset $A$ of a finite abelian group $G$ is called generating if every element of $G$ can be expressed as the combination of finitely many elements of $A$ and their inverses. For a given integer $b$, the capped $b$-critical number of $G$, $\chi(G,b)$, is defined as the minimum number $m$ for which the $b$-fold sumset of all generating subsets of $G$ with size greater than or equal to $m$ generate the whole group $G$. We are interested in finding the value of $\chi(G,b)$ for any group $G$ and positive integer $b$, where

$$\chi(G,b) = \min\{m \mid |A| \leq G, (A) = G, |A| \geq m \implies bA = G\}.$$ 

Here, we prove a concrete upper bound for this value in relation to the similar quantity $\chi(G,0,1)$, and establish equality of $\chi(G,b)$ to $\chi(G,0,1)$ for a class of groups for which $\chi(G,0,1) = n$. 

1:37 pm – 1:47 pm

What’s New With You? About the maximum size of a weak $(k,1)$-sum-free subset of an abelian group

Erik Wendt

The maximum size of a subset $A$ of $G$ for which the sum of $k$ distinct elements in $A$ does not equal the sum of $l$ distinct elements in $A$ is denoted by $\mu(G,(k,l))$. We are interested in finding exact values for $\mu(Z_m,(k,l))$ for cyclic and non-cyclic groups, as well as finding upper bounds for $\mu(m,(k,l))$, values of $m$ such that $\mu(Z_m,(k,l)) > m$ for all groups with order greater than $n$, where $n,m \in \mathbb{N}$. Here, we find lower bounds for $\mu(G,(k,l))$ for certain non-cyclic groups, find equality between $\mu(G,(k,l))$ and $\gamma(G,(k,l))$ in some specific cases, and find upper bounds for $\mu(m,(k,l))$ in some cases of prime order.

1:50 pm – 2:00 pm

When the size is not large enough

Adrian Navarro

We know from Corollary 1.4 and Theorem E.1 that there is some subset $A$ of $Z_m$, if $n$ is even, of exactly half the size of the group such that $|A| = G$, for any $h > 3$. It is easy to see, for the subset $A$ of all even integers in $Z_m$, $|A| = A$. In this paper we establish the additional result: the only two subsets $A$ of size $\chi(Z_m,3)$ for which $|A| = G$ will be the subgroup already mentioned and its complementary coset: the subset of all odd numbers in $Z_m$.

2:02 pm – 2:12 pm

On Restricted Sumsets $\chi^-$

Michael Moore

$\chi^-$ is the minimum value of $m$ for which every $m$ size subset of $G$ has $\{0,1\} \subseteq G$. For $G \cong Z_m$, we are interested in finding $\chi^-$ for odd values of $m$ and an even $s$. We found $\chi^-$ for odd values of $n < 20$ for $s = 3, 4, 5, 6, 7, 8$ and proved a general formula for non-generating sumsets. This creates a lower bound for $\chi^-$ and helps establish a pattern between different values of $s$.