**Guangzhou Discrete Mathematics Seminar**

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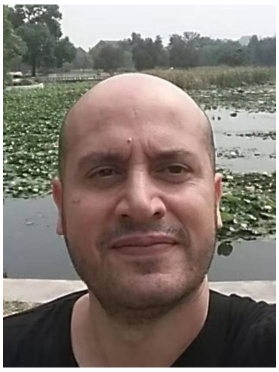
# *Additive decompositions of sets of integers into irreducible sets*

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Room 415, School of Mathematics, Sun Yat-sen University


Let $\mathbf{Z}$ be the ring of integers. A set $A \subseteq \mathbf{Z}$ is called *irreducible* if $|A| \neq 1$ and $A \neq X + Y$ for all $X, Y \subseteq \mathbf{Z}$ such that neither $X$ nor $Y$ is a singleton. Accordingly, if $X \subseteq \mathbf{Z}$ and $|X| \geq 2$, we denote by $\mathsf{L}(X)$ the set of all integers $n \geq 1$ for which there exist irreducible sets $A_1, \ldots, A_n \subseteq \mathbf{Z}$ such that

$$X = A_1 + \cdots + A_n := \{a_1 + \cdots + a_n : a_1 \in A_1, \ldots, a_n \in A_n\}.$$

It was conjectured in [1, § 5] that, for every non-empty finite set $L \subseteq \mathbf{Z}_{\geq 2}$, there exists a set $X \subseteq \mathbf{Z}$ such that $\mathsf{L}(X) = L$. I will survey what (little) is known about this conjecture and frame the problem within the broader context of factorization theory.


## Reference


[1] Y. Fan, S. Tringali, *Power monoids: A bridge between factorization theory and arithmetic combinatorics*, J. Algebra **512** (2018) 252–294.


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