XIAMEN UNIVERSITY MALAYSIA
厦門大學馬來西亞分校

# Research Talk

## Complete Decompositions and Complete Factorisations of Groups

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Research interests: Group theory, problems in group factorizations, and representation theory,

## Speaker Introduction

Mr. Wang Kah Lun is a Lecturer at Xiamen University Malaysia, and he was Graduate Research Assistant at the University of Malaya. Moreover, he was Lecturer at Methodist College Kuala Lumpur, and his Ph.D is expected to be defended in this year 2023.

## Abstract


Let $G$ be a group and let $A_1, \ldots, A_k$ $(k \geq 2)$ be nonempty subsets of $G$. The sequence $[A_1, \ldots, A_k]$ is called a complete decomposition of $G$ if the product $A_1 \cdots A_k$ is equal to $G$ and the sets $A_1, \ldots, A_k$ are mutually disjoint. The integer $k$ and the sum $\sum_{i=1}^{k} |A_i|$ are called the order and size of $[A_1, \ldots, A_k]$, respectively. A complete decomposition $[A_1, \ldots, A_k]$ of $G$ is said to be a complete factorisation of $G$ if every element of $G$ can be uniquely expressed as a product of the form $a_1 \cdots a_k$ with $a_i \in A_i$ for each $i = 1, \ldots, k$. In this talk, we discuss the existence of complete decompositions of groups. We also discuss the structure of groups that have a complete decomposition satisfying certain conditions. In addition, we discuss the possible orders and sizes for complete decompositions of a group. Next, we discuss necessary and sufficient conditions for a finite abelian group to have a complete factorisation.