In joint work with Gregg Zuckerman the notion of a small subalgebra was introduced. That is, given a simple Lie algebra \( g \) and a simple subalgebra \( k \), we say that \( k \) is small in \( g \) if there exists a positive integer \( b \) (depending only on \( g \) and \( k \)) such that in the restriction to \( k \) of each finite dimensional representation of \( g \) there exists an irreducible \( k \)-representation of dimension at most \( b \).

We assume the field is \( \mathbb{C} \). Let \( n \geq 3 \). Given any subalgebra, \( \mathfrak{t} \), of \( \mathfrak{sl}_n \), if \( \mathfrak{t} \cong \mathfrak{sl}_2 \) then \( \mathfrak{t} \) is small in \( \mathfrak{sl}_n \). In joint work with Hassan Lhou the speaker found that \( n \) is a best possible bound \( b \) in this case.

The question of when \( \mathfrak{t} \cong \mathfrak{sl}_k \) is small in \( \mathfrak{sl}_n \) is related to the notion of plethysm. Using a well understood interpretation of plethysm, we relate the question of small \( \mathfrak{t} \cong \mathfrak{sl}_k \) to the representation theory of the symmetric group. (Received September 24, 2018)