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*Steiner triple systems with well-behaved automorphisms*

A design is called  $f$ -pyramidal when it has an automorphism group fixing  $f$  points and acting sharply transitively on the others. We consider the problem of determining the set of values of  $v$  for which there exists an  $f$ -pyramidal Steiner triple system of order  $v$ . Although this problem has been deeply investigated when  $f = 1$ , it remains open for a special class of values of  $v$ . For the next admissible value of  $f$ , which is  $f = 3$ , we provide a complete solution. However, for greater values of  $f$  this problem remains widely open.

In this talk, we will present the most recent results on this subject. This is joint work with Marco Buratti and Gloria Rinaldi.