One challenging problem is counting pattern-avoiding set partitions. A set partition can be written in a uniform way if each block is written in increasing order, and the blocks are ordered by increasing minimal elements. With this convention, any set partition of \( \{1, \ldots, n\} \) can be encoded as a string \( s_1 \cdots s_n \) where \( s_i = j \) if element \( i \) lies in block \( j \). It is easily seen that a partition is non-crossing if its string encoding avoids the pattern 1212. Further results involving pattern-avoiding set partitions were developed by Klazar, Sagan, and Goyt.

Motivated by recent results for pattern avoidance in colored permutations, we define the notion of pattern-avoiding colored partitions. A colored set partition is one where each number of the set partition is assigned one of \( k \) colors. Given colored set partitions \( P \) and \( R \), let \( P^* \) and \( R^* \) be the underlying uncolored set partitions for \( P \) and \( R \) respectively. We say \( P \) contains \( R \) if \( P^* \) contains \( R^* \) as a subpartition, and if the colors on the subpartition equal those of \( R \). Initial enumerative results will be provided as well as conjectured relationships to other combinatorial objects. (Received September 21, 2009)