CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Thursday, February 28
1:00 PM – 2:00 PM
Maria Sanford, Room 103

RESOLVABLE SPACES

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Abstract: There are rational numbers and irrational numbers in any open interval in the real line, i.e., the set of rational numbers and the set of irrational numbers are dense in the real line. Intuitively, we can pick one rational number and one irrational number from any open interval. Can we do better? Can we get 2, or 3, …, or infinitely many pairwise disjoint dense subsets of the real line? Yes, in fact, we can pick, for any size κ up to $c = |R|$, κ–many different numbers from any open interval and form κ–many disjoint dense subsets.

In my research subject, we focus on a special type of topology, namely, Tychonoff topology. A question open from 1967 to 2007 has been: "If a Tychonoff topology that has infinitely many disjoint dense subsets, must it necessarily also have the maximal possible number of disjoint dense subsets (that is, $c=|R|$-many, in the example above)?" In joint work with W.W. Comfort, we show, among other things, that: (1) almost every Tychonoff topology can be expanded (by adding extra sets) to a bigger topology with infinitely many disjoint dense subsets, but not maximally many disjoint dense subsets; and (2) every Tychonoff topology that has at least n disjoint dense subsets, can be expanded to a bigger Tychonoff topology that still has n disjoint dense sets but does not have n+1 disjoint dense subsets.