CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, March 22
3:00 – 4:00 PM
Maria Sanford, Room 101

CONTINUITY, COMPACTNESS AND CONNECTEDNESS

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Abstract: The concept of continuous function is one of the most fundamental in mathematics. It is so important that sometimes it is used to divide mathematics (hypothetically) into two parts – continuous and discrete. Compactness and connectedness are two of the most important topological properties that arise naturally in calculus.

Continuity, compactness and connectedness are related in a natural way. For example, it is well known that continuous image of a compact space is compact, and that continuous image of a connected space is connected. But it is not so well known when the converse is also true i.e. if $f: X \to Y$ is a function such that $f(K)$ is compact for every compact $K \subseteq X$ and $f(C)$ is connected for every connected $C \subseteq X$, then is f continuous?

In this talk, after introducing all necessary definitions as seen in an introductory Real Analysis class, I will generalize them in a natural way to topological spaces. Then I will mention some old and some more recent results that shed light on the above question.

I will try to make the talk accessible for Calculus I students and above.