

1106-54-400

Koushik Pal* (koushik.pal@usask.ca) and **Samer Assaf** (samerassaf@hotmail.com). *Partial metric spaces with negative distances and fixed point theorems*. Preliminary report.

Metric spaces have been studied by mathematicians for ages. Their importance in several areas of mathematics cannot be overemphasized. About two decades ago, Steve Matthews introduced a major generalization of metric spaces, where the distance between a point x and itself, called the *self distance of x* , is not necessarily zero. He called them *partial metric spaces*. He went on further to prove an analogue of the Banach Fixed Point Theorem for such spaces. Very recently, we have introduced a major generalization of partial metric spaces, where we not only allow for nonzero self distances, but also allow for “negative distances”. We call such spaces *generalized partial metric spaces*. Such metrics have a strong connection with “scoring functions” in biology. In this talk, we will start with a motivation for using negative values. Then we will present a generalization of the partial metric fixed point theorem in this generalized context, which is a generalization in several ways. And finally, we will also present a further generalization of metric spaces, called the *strong partial metric spaces*, which are much nicer than partial metric spaces at least as far as some of the fixed point theorems are concerned. (Received August 27, 2014)