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Title:	The locus and compound locus for the research of exoplanets and other cosmological objects (Theory)
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Abstract:

The principal aim of this paper is to introduce the locus and compound locus in Cosmology. it is an attempt to physically interpret them in an expanding Universe to determine the possible position and distance of cosmological objects from the known position and distance of host cosmological objects. In this paper we consider only the case of locus and compound locus on multiple star systems such as the red dwarf star system, the closest stars to the Sun from the Milky Way spiral galaxy to determine the possible position and distance of new exoplanets around of these key red dwarf stars that are the smallest, coolest and most common type of stars.

In classical geometry, a locus or geometric place(plural is : loci)is a set of points whose location and distance is determined by one or more specific conditions given by some Locus Theorems. The geometric form created by the set of points which move must always obey a given set of conditions. The locus(path) of points is also connected to a moving configuration like our Universe in expanding. This usually results in a curve or surface. So, for example, the locus from any given point is a circle.

We consider the locus and compound locus to determine the possible location and distance of new exoplanets around the red dwarf stars when the position and distance of these host stars are known and obeying some specific conditions.

The physical interpretation of locus of points will be called a locus of new exoplanets from known position and distance of host stars.

The two Locus theorems used are: The Locus Theorem 1 and The Locus Theorem 3.

The Locus Theorem 1: the locus of points at fixed distance d, from a point P is a circle with the given point P as its center and d as its radius.

The locus Theorem 3: the locus of points equidistant from two points, P and Q, is the perpendicular bisector of the line segment determined by the two points.

The strategy for solving compound locus problems is the following: if two locus conditions in a problem exist(a compound locus), one must prepare each condition separately on the same diagram. After the two conditions are drawn separately, count the number of points where the two loci conditions intersect. These points of intersection will be the response to the compound locus problem. In a compound locus problem one must also look for the possibility of the words AND or AND ALSO separating the conditions.

There are two applications:

Application 1. Locus of Venus and the Earth around the Sun and possible maximum position and distance between the Earth and Venus.

Application 2: The possible location and distance of new exoplanets from the following red dwarf star system:

Proxima Centuri, a red dwarf star located to 1,30pc from the Sun,

Lacaille 8760, a red dwarf star located to 3,95pc from the SUN,and

Bernard's star, a red dwarf star located to 1,83pc from the Sun.

How could us determine the possible location and distance of new exoplanets?.

It is possible by using the locus and compound locus and we have obtained as

result: A new possible exoplanet to the possible and distance of 2,2435 pc from the Bernard'star and with a possible distance between Lacaille 8760 and Bernard's star of 4, 487pc.

Of course that our geometric model based on locus(path) of points and compound locus is an approximation geometric method because our Universe is expanding.

Any cosmological object could form locus of points from the Sun to condition that the possible location and distance be known and obeying some specific rules or conditions.