

KNOT THEORY, IT'S KIND AND DIFFERENT ASPACTS IN MATHEMATICS AND IN SCIENCE

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ABSTRACT : *The main purpose of Knot theory is to clarify a difference between Knot phenomena in Mathematics and in Science. In this, a building Power and a Computational ability in mathematics are needed in addition to the intuition Power having to do with a figure. We can watch a Knot with eyes, our ability of space perception will be grown up by playing with it, and we are able to differentiate between different kinds of Knots. After that we will able to interlink different knots with each other that how it is used in mathematics and in science.*

KNOTS: Everyone can creat and make different types of Knots by practice. Knots are those whose ends were joined together and they are classified from branch of Topology which is known as Knot Theory.

On our left side, we can see a trefoil which is known as left trefoil and which is on our Right side is known as Right trefoil. It is impossible to continuously deform one into another. Therefore, we can say that two knots are topologically equivalent and also there exists a topological transformation that maps one into another.



HISTORY IN MATHEMATICS: In the Knot theory until 1984 the main tool to tell the knots apart was the Alexandar Polynomial so named after the American Mathematician J.W.Alexandar.

But from that theory we did not distinguish between the two trefoil Knots.

This knot which we are talking about is not simply a mathematical knot but it also resembles as a knot in string. Thomson's theory Knots is one of them which studies on esoteric branch of pure mathematics.

The main Aim of Introducing Knot Theory is that with the help of this theory we can identify different properties and different kinds of Knot Theory and also we can predict Knots Invariant.

A Knot Invariant is the "fingerprint" of the Knot and it does not change by superficial deformations of the Knot.

KNOTS, LINKS AND SPATIAL GRAPHS

A **Knot** is some special type of tangled string in Euclidean space R^3 which is usually considered as a closed tangled string in R^3 .

LINK: Link is the union of knots which are mutually disjoint.

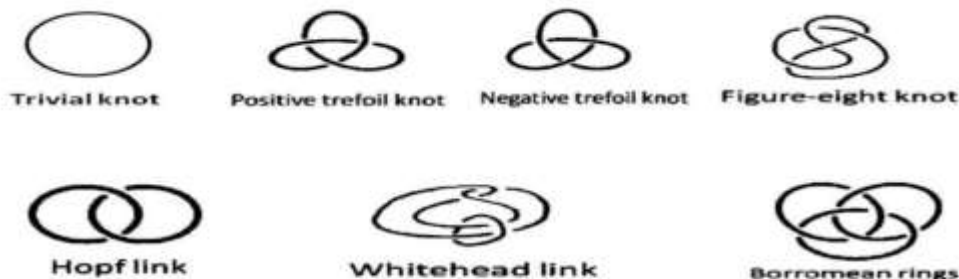


Figure 1: Knots and links

SPATIAL GRAH: A Spatial graph is the union of strings with endpoints in R^3 and these are Mutually disjoint except the endpoints. A Vertex of a spatial graph is a point where more than 3 strings are grouped and an edge of this is a connected component of the strings obtained from this by cutting along all the vertices of this.

Example, Kinoshita's θ - curve is a spatial graph with two vertices and three edges.



Figure 2: Kinoshita's θ -curve

An aside: There are so many ways to create a trefoil Knot . Start from the basic to create Moebius strip. But at this time we have to twist one end of the strip three half turns. Now cut the one side of the strip along the middle line. We get a trefoil Knot. And Other surfaces can be obtained by joined and cut a paper strip.

Topology emerged as a part of Geometry which did away with metric properties of shapes – angles and distances and showing mirror images.



This is showing the equivalence of the figure – eight Knot and the mirror image

SPHERE AND CUBE: Sphere and Cube are the same object that can be transformed into another.

To find out a Knot in Natural science there are so many examples about structure of Knot and different types of Knots : Which one can considered as a string becomes important. Here are the some example.

Example -1 : It is possible to think a chain as a link which are twined round one after another like a string .



Example – 2 Assume that there are n particles moving in the plane with respect to time.and this type of motion forms an n – braid in the 3 – D space .

Example -3 When we considered an example of DNA as one string long rope, whis is become a closed curve called DNA Knot.



Example -4: The Seismometer is a machine which can predict or draws the trace of motion of earthquake by an Observation point with respect to time and known as earthquake curve and also it looks like spatial curve.

Example -5: On the Cosmos there is large scale structure which is recently known as the Astrophysicists.

CONCLUSION : I mention these elements of the Knot theory for two reasons.

One is that with all specialization of tools and interests due to the growth of the body Mathematics, and this science is unified in the basic strains permeate virtually in every branch of Mathematics and this is a regular occurrence to detect links between distinct mathematical theories and about Natural Science.

The second reason is that there are numerous examples in the history of mathematics which gives an important information and discuss with proper examples by independent researchers, in world there are most of numbers or common consciousness which are hidden and waiting to be grasped by human minds. The end to the Philosophical discussion whether mathematics is being invented or discovered is nowhere sight.

REFERENCES: There are large number books in which we can get more knowledge about Knot Theory and some of which are listed here.

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