

# The Geometry and Physics of Knots

SIR MICHAEL ATIYAH

When a mathematician addresses a general scientific audience, even as enlightened an audience as attends a Royal Institution Discourse, he faces a daunting task. Mathematics can be such a highly technical and abstract subject that communicating its latest developments to a lay public presents formidable difficulties. Bearing this in mind I selected this evening's topic according to the following criteria. It should have:

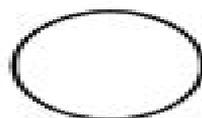
- (1) a simple visual content;
- (2) an interesting historical background;
- (3) a relation to physics;
- (4) a recent exciting story.

I picked on the subject of knots because it seemed to satisfy all these criteria, and on 11th July 1988 I sent my title off to the Royal Institution. Two weeks later, on 26th July, there was a spectacular further break-through which will be my main focus and makes the story even more exciting and topical than I had originally anticipated.

## Knots, Links and Braids

Let me begin by introducing the dramatis personae of the evening: *knots* and their close relatives, *links* and *braids*. For a mathematician a knot is a closed piece of string, with no loose ends, exemplified in Figure 1.

These pictures represent the piece of string laid flat on a table, so that at each crossing point one piece is 'under' and the other piece 'over' as indicated. Two knots are considered the same if we can manipulate one so that it looks like the other. The precise length (and thickness) of the string is irrelevant. Only its



Unknot



Unknot



Trefoil

Figure 1

# Geometry And Physics Of Knots

**Puja Mehta**



## **Geometry And Physics Of Knots:**

## **Geometry And Physics Of Knots** Book Review: Unveiling the Magic of Language

In an electronic era where connections and knowledge reign supreme, the enchanting power of language has been apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is truly remarkable. This extraordinary book, aptly titled "**Geometry And Physics Of Knots**," compiled by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we shall delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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