CSE200: Online-1 on LaTeX

Instructions:

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Topic	**Marks**
Text Formatting	10
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Footnotes	10
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An Overview of String Theory

Your Name (Your Student ID)

Today's Date

1 Introduction

~~$string~~[1] "String theory" proposes that point-like particles of particle physics are replaced by one-dimensional objects called strings [1]. It describes how these strings propagate through space and interact with each other.

2 The Basics of String Theory

In string theory, the basic idea is that the fundamental constituents of reality are strings of incredibly small scale (approximately 10^{-35} meters in length), and their vibrations determine the mass and force charges of the particles. See Figure 1 for visual representations of string theory concepts.

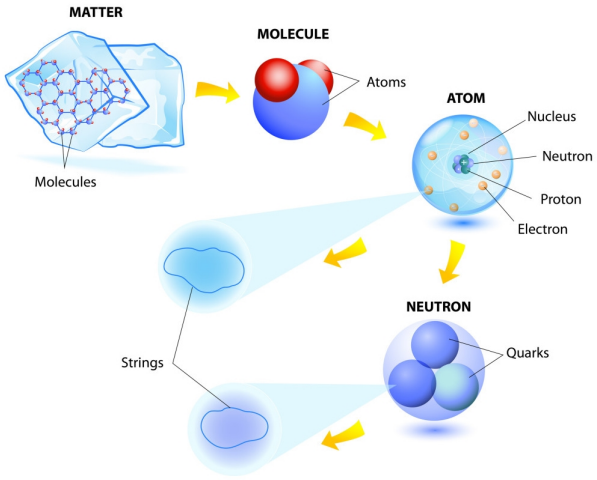
3 Theoretical Dimensions

Table 1 presents different theoretical dimensions and their implications in string theory.

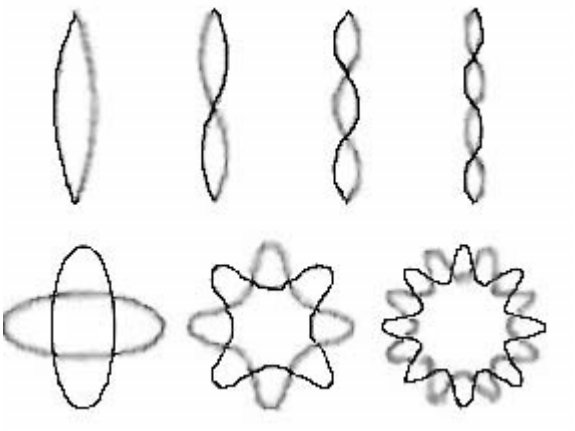
Table 1: Various String Theory Models

Model	**# Dimensions**	**Implications**
Superstring Theory	10	Offers mathematical consistency in quantum gravity.
M-Theory	11	Proposes a unifying string theory, predicting a multiverse.
Bosonic String Theory	26	Only includes bosons, requires high dimension count for consistency.

[1] Intentionally done for LaTeX skill evaluation.



(a) Hierarchical structure from molecules to strings



(b) Different vibrational modes of strings

Figure 1: Illustrative diagrams of string theory concepts

4 Dynamics of Strings

The Nambu-Goto action in string theory, describing the dynamics of a classical string, is given by:

$$S = \textbf{The full equation is shown on the screen/projector.}$$

where:

- S is the action integral.
- T is the string tension.
- g_{ab} is the induced metric on the worldsheet of the string.
- τ (*tau*) and σ (*sigma*) are the parameters on the worldsheet.

NOTE: This article is solely designed for evaluating students' LaTeX skills.

References

[1] Barton Zwiebach. *A First Course in String Theory*. Cambridge University Press, 2004.