

## New concepts of *spherical* geometry for physical & cosmological applications

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### Abstract

After establishing the fundamental physics prizes, Yuri Milner said: *“Unlike the Nobel in physics, the Fundamental Physics Prize can be awarded to scientists whose ideas have not yet been verified by experiments, which often occurs decades later. Sometimes a radical new idea “really deserves recognition right away because it expands our understanding of at least what is possible.”* Keeping this mind the author formulated two spherical geometrical theorems which may applied for the studies and probes of fundamental particles, quantum gravity, gravitational waves ,dark matter and dark energy.

**Keywords:** pre-big bang, particles, space , matter , energy , expansion, contraction.

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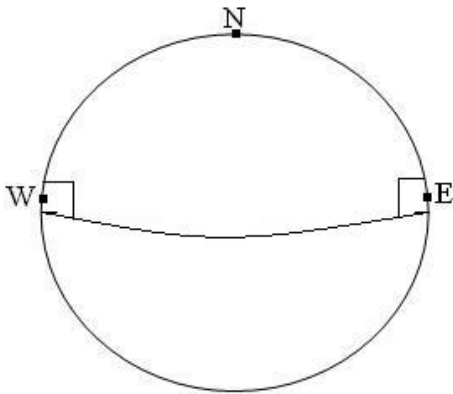
### Introduction

The Pauli exclusion principle was postulated in an attempt to explain some of the properties of electrons in an atom. This principle says that in a closed system, no two electrons can occupy the same state..Heisenberg’s uncertainty principle states that the position and momentum of a particle cannot be simultaneously measured with arbitrarily high precision. Special relativity applies only to cases in which objects are moving at a uniform velocity. General relativity, however, is applicable to all forms of accelerated motion. This theory of general relativity arose from Einstein's principle of equivalence. Einstein formulated this principle by examining a given mass in two different states. Einstein’s equivalence principle is any of several related concepts dealing with the equivalence of gravitational and inertial mass, and to Albert Einstein's observation that the gravitational "force" as experienced locally while standing on a massive body (such as the Earth) is actually the same as the *pseudo-force* experienced by an observer in a non-inertial (accelerated) frame of reference. Like these easy and brief principles, the author proposes the following spherical geometrical theorems.

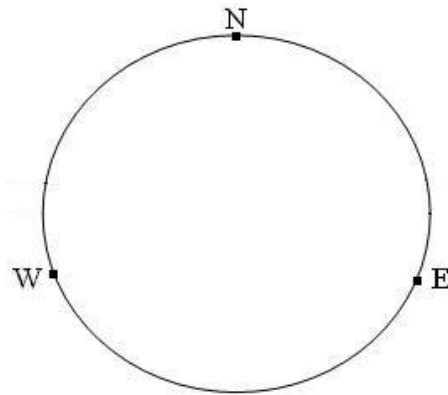
***Theorem 1 : There exists a spherical triangle whose interior angle sum adds to 360 degrees***

***Theorem 1 : There exists a spherical triangle whose interior angle sum adds to 540 degrees***

## Construction



Spherical Figure I



Spherical Figure II

### Proof of theorem 1

In spherical figure 1. Consider NB , WE and EN as the three sides of triangle NEW. WE is the equator of spherical figure 1 and both EN and WN are perpendiculars to WE. Since the angle WNE is a straight angle, we get that the sum of the interior angles of spherical triangle WNE is equal to 360 degrees. And hence the proof.

### Proof of theorem 2

In spherical figure 2, consider WN , NE and EW as the three sides of spherical triangle WNE. Since the angles WNE , NEW and EWN are straight angles, we obtain that the sum of the interior angles of spherical triangle WNE is 540 degrees. And hence the proof.

## Discussion

It is well known that Einstein's general relativity is the geometrical interpretation of gravity. There are a number of challenging problems in physics such as the inclusion of graviton and darkons in to the standard model of particle physics, quantum gravity, gravitational waves, dark matter , dark energy and formation of particles and matter. The applications of above mentioned theorems may unlock one of these burning physical problems

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