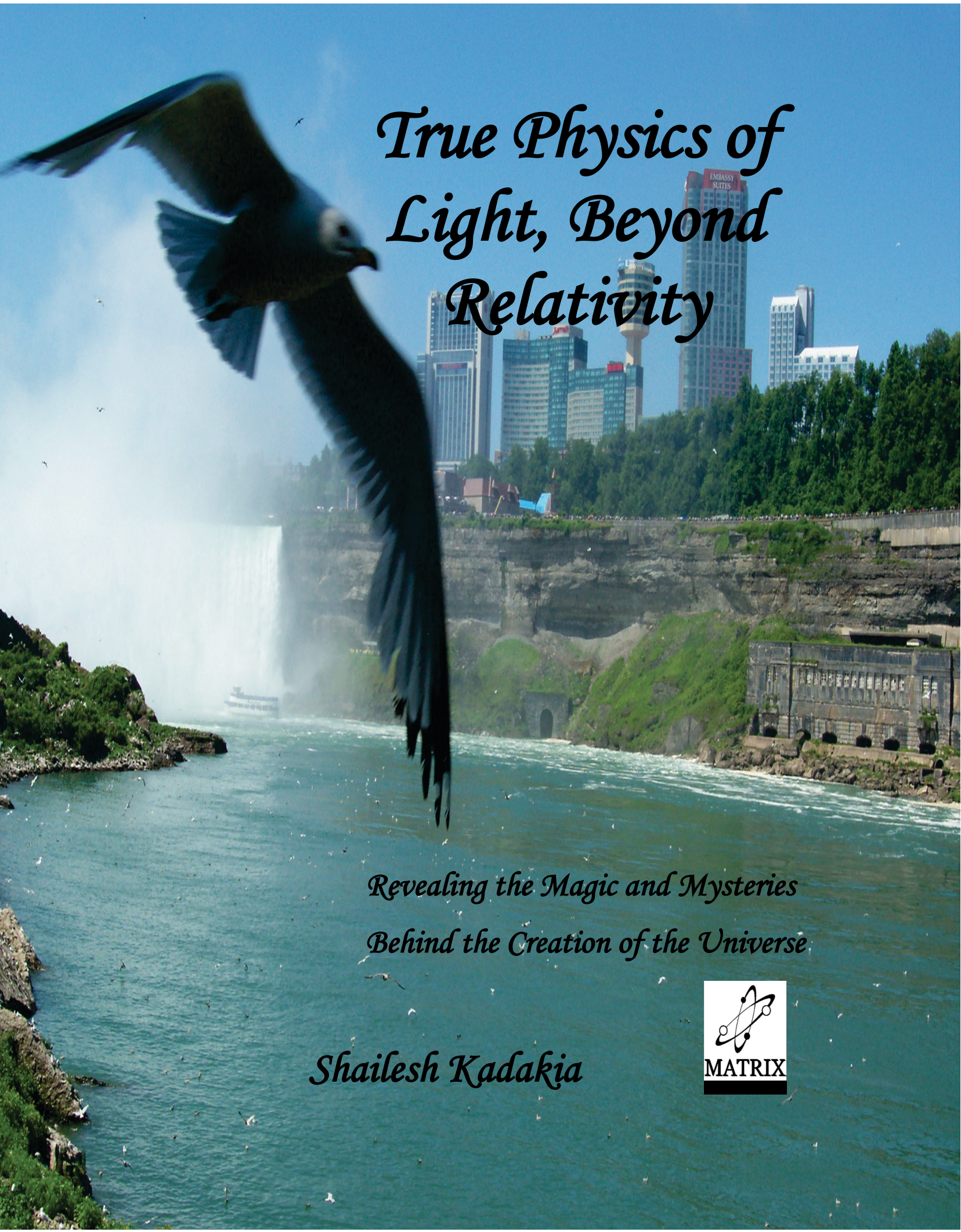

True Physics of Light, Beyond Relativity

Revealing the Magic and Mysteries Behind the Creation of the Universe

Shailesh Kadakia

MATRIX

True Physics of Light,

Beyond Relativity

Shailesh (Sky) Kadakia

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Behind the Creation of the Universe

With 40 illustrations of which 29 in Color

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Dedication

To my parents,

Lilavanti R. Kadakia & Rasiklal S. Kadakia

Thank you for your constant encouragement and support.

– Shailesh Kadakia

Preface

An energy source, such as light, can be seen by humans yet cannot be otherwise sensed. It is known to have no material mass yet has revealed visible and physical effects of mass through several physical phenomena, such as photoelectron emissions and others. This strange nature and behavior of light energy waves has made it the most poorly understood energy source of nature. Often in the past, many scientists have erroneously modeled the dual behavior of light, sometimes as a particle and sometimes as a wave. After reading this book, you will be convinced that light energy waves strictly behave as waves, and that all of the phenomena and results of experiments over the past two centuries, to prove that light occasionally behaves as particles, were incorrect. Another source of energy is the force of gravity whose cause is not known to date. In this book, we have attempted to analyze the root causes of the force of gravity, among different celestial objects in the universe. Another puzzling question is, at what speed the force of gravity propagates? Albert Einstein had suggested that in vacuum, the propagation speed of gravity is the same as the speed of light waves. According to the postulates of the special theory of relativity, the speed of light in a vacuum is constant **c**. The speed of light varies according to the frame of reference, which is in-concert with the varying speed of light (VSL) theory proposed by the Portuguese physicist, João Magueijo, a research fellow in theoretical physics at Cambridge University. Therefore, it is imperative to answer the question, at what speed the force of gravity among different objects propagates. The speed of light is no longer constant in accordance with the **Skylativity**® theory.

The main intention of this book is to correct the basic understanding of the fundamental ideas regarding the nature of light, the special theory of relativity, and the general theory of relativity. The book is primarily written for first-year college students who are considering physics major. It assumes competence in high school algebra, geometry, and calculus. Since our emphasis is on improving the conceptual understanding of physics, and not to understand mathematical rigors, we have discussed analytical expressions with simplicity. Another purpose of this book is to determine an ideal theory of everything that will tie the creation of the universe, which contains huge celestial objects, such as galaxies, super nova, and nebulae, to the tiniest fundamental particles, such as quarks and fermions. Also, we shall utilize the concepts of the **Skylativity**® theory to marry classical mechanics with quantum mechanics and create a universal unified field theory (UUFT) of everything.

The content of this book is organized as follows:

In Chapter 1, we begin with a discussion on the nature of light and we are very critical about its behavior as a wave and not as a particle in some events, as quoted by Einstein and others. Then, we touch on some of the events that our predecessors thought were occurring as a result of the bending of light by the force of gravitation. A detailed examination of the

analysis of events will convey that it is impractical to predict that light waves are bending by the force of gravity. Next, we explain why the conclusion that light behaves as a particle, based on experiments performed in early 1900's, through modern times, may be incorrect. We demonstrate this by analyzing the sets of experiments of the photoelectric effect, short wavelength limit X-rays, the Compton Effect, and Michelson's interferometer. We substantiate the wave theory of light by explaining Doppler's shift effect and the rotation of a fan when its thin blades are coated with semiconductor paste and are exposed to light. Also, we point out that the concepts of time dilation, introduced by Einstein and Lorentz, are incorrect as a result of the wrong conclusions drawn from the analysis and results of Michelson's apparatus. In this chapter, we successfully indicate that some of the ideals proposed by Einstein, and subsequently promoted by Lorentz and others, may require further analysis.

In Chapter 2, we describe the basic differences between the physical properties of a wave like entities, and particles. Then, we explore the speed of the propagation of light and electromagnetic waves. We emphasize that the speed of light and electromagnetic waves is variable and it should vary differently in medium with different refraction coefficients. Also, it should alter if the frames of reference are moving at different speeds. Then, we introduce the concept of the true speed of light and formally define it, based on the distance between the speed measuring instrument and the source of light as invariant over the arbitrarily small time interval. We explain the importance that not all of the energy waves of the electromagnetic spectrum should be travelling at the same speed. Therefore, it may be imperative that the electromagnetic spectrum table should be split into three or more tables. We briefly discuss the strengths of the interactions of weak, strong, and residual forces on interacting particles and compare them over the range of the distances they encounter. Next, we analyze the expressions for the energy released during a nuclear radiation and explosion event and in general, the method for specifying the energy content of the light waves. In our analysis, we prove that the energy released during a nuclear explosion event, computed by Einstein's equation $\mathbf{E = M \times c^2}$, estimates the energy liberated in the excess amount rather than the actual value. Also, we explain that the major source of the energy released, is from the liberation of the binding energy of the nucleons at the core of the atoms of the radioactive matter and not the consumed mass of the matter, as explained by Einstein, in a nuclear explosion device, when detonated. We provide the correct analytical expression for the released binding energy. In this chapter, we also choose to discuss the topic of the temperature profile of the prime energy source, the sun in our solar system. We want to direct our attention to the fact that the temperature calculations predicted by the current techniques have provided large values for the surface and core temperature of the sun. These numbers are unrealistic and other methods are needed to confirm the results of the measurements to date. In particular, this is true for the 15M°K estimate for the core temperature of the sun. To predict the temperature profile for the sun's core, we have proposed a different solution.

In Chapter 3, we start explaining the theory of relativity, as postulated by Einstein, which has been widely accepted for a little over the past century. Here, we want you to be familiar with and refresh your memory about the basic concepts of the general and special theories of

relativity, first introduced by Einstein. We shall refer to his theory as the E-theory, from the name of its inventor, Einstein. Also, we shall use a similar name to abbreviate and refer to the postulates of special and general **Skylativity**® theories introduced by us, as K-theory. In the next section, we state postulates of the special and general **Skylativity**® theories. We highlight the differences between the postulates of E-theory and K-theory and explain the implications of the new theory to the applications of radio astronomy and cosmological measurements. Next, we point out, that on the basis of the new theory, Lorentz expressions for length, mass, and time computations for different inertial systems, are not required. Then, we discuss the modifications required in Maxwell's field equations, to reflect the variation of the speed of light among different frames of reference. Finally, we describe the changes required in the solution of Einstein's field equation that take into account the varying speed of light **c**.

In Chapter 4, we begin with a discussion of the limitations of Einstein's general and special theories of relativity, when applied to the measurement of length, time, and mass. We describe an example of a common incandescent light bulb to show that light energy can be generated when a finite amount of electrical energy is supplied. By showing this, we are stating that with a finite source of energy, light photons from a tungsten wire filament can be accelerated from zero speed to light speed. This contradicts the claims of the earlier theory that an infinite energy supply is needed to attain the speed of light. In Section 4.2, we indicate that, in the same example of the light bulb, when a filament emits light, it does not lose any mass. Therefore, for every event where the light energy is released, the popular energy to mass conversion relation, $\mathbf{E = M \times c^2}$, does not hold well. In Section 4.3 we explain that if we believe for an object, a different measured mass value for a different inertial system, we have to infer that the speed of light should be different in those frames of reference. This is true because the mass in both reference systems possesses the same rest mass energy. To resolve this conflict of mass variations for masses of moving objects, we introduce a concept that total mass consists of a real rest mass component and an energy mass component. The distribution of the rest mass component supposedly affects the center of gravity. The orthogonal imaginary component, the energy of mass, may affect the future position of the center of gravity after time $\boldsymbol{\delta t}$ is known as the dynamic mass. In Section 4.6, we propose that time dilation is a fictitious concept that was introduced by Einstein and others. His skewing of the time dimension does not make sense. Therefore, the time dimension is invariant and measured time will always be the same if clocks in the two inertial systems are truly identical. In the final section 4.7, we show that the stellar parallax distance measuring method would introduce a vast number of errors, if we assume that the light rays arriving from other stars, when passed by the sun, will be deflected by the force of gravity from the sun. Hence, it makes sense to state that light rays do not bend by the force of gravity.

We firmly believe that the Lorentz transformation equations for mass, length, and time measurement, for different inertial systems, are not needed. Therefore, in Chapter 5, to investigate a hypothetical situation, we explore the effect of the variable speed of light on the mass, length, and time measurement, using the current Lorentz transformation. We analyze

the values of mass, length, and time measurements for two different scenarios, approaching systems and receding systems. In the infinite universe, those two scenarios play a more important role in the space coordinate transformation than the linear movement in the X, Y and Z directions for two or more systems.

In Chapter 6, we highlight the benefits derived when the new postulates of the **Skylativity**® theory are applied to modern day astronomy and space science. In the first section, we describe the ways that create surplus funds and resources. We convince you that it may not be essential to invest funds in the construction of huge super colliders. At present, a significant amount of resources are spent to build proton accelerators to determine if the speed of light is achieved by a particle. The postulates of the **Skylativity**® theory state that the speed of light is achievable by particles, therefore, the financial and manpower resources may be saved by not applying them toward the construction of huge super colliders in the future. In Section 6.2, we stipulate that the measurement scales for mass, length, and time units are universal and constant among different frames of reference. This approach avoids the complex formulation of the Lorentz contraction of length and time dilation, while computing the coordinates in different inertial systems. In Section 6.3, we address the decay rate of very weak interacting neutrino particles from the sun. Scientists believe that the lifetime of these particles is very short, so, they will disintegrate before they reach the Earth's atmosphere. The particle survives because the decay rate is slowed by the time dilation factor computed according to the Lorentz formulation. We believe that time dilation is a virtual effect and should not affect the decay rate and disintegration of the neutrinos. In Section 6.4, we propose that the discovery of quarks allows us to develop future weapon systems with enormous power, similar to the fission of ^{238}**U** into ^{235}**U**. Alternatively, the controlled triggering mechanism that smashes protons and neutrons into quarks may be applied to design power plants. These power plants have the potential to generate a vast amount of energy source from the release of the binding energy of quarks. We shall call this proton and neutron power plants. In Sections 6.5, 6.6 and 6.7, we discuss the future of the space program and suggest ideas for the design of spacecrafts that travel at fractions of the speed of light.

In Chapter 7, we develop the universal unified field theory (UUFT) that integrates the effect of gravity from macroscopic objects, such as celestial stars, galaxies, and nebulae, with the strong forces of particles in the standard model which deals with microscopic particles. This has been a huge challenge in the past because gravity is found to be a very weak interacting force, as compared to the charge and spin momentum forces with strong interaction effects within nucleus of tiny atoms of particles. Next, we analyze the reasons for gravity. Every object in the universe projects a force of gravity on another object because both objects possess momentum and potential energy associated with each other. As per our explanation, the force of gravity exists among any two objects that have real mass and a static location for the center of gravity. Therefore, the force of gravity from large celestial objects does not have any effect on the trajectory of wave entities, such as light rays and electromagnetic radiation energy waves. In section 7.3, we briefly discuss time travel, which is a fictitious concept. Time travel only exists in your imagination because time dimension cannot be retraced. For instance, the conversion of hydrogen into helium atoms, through the

thermonuclear burning process on the sun, is an irreversible process. This implies that, at the end of the life of the sun, the death of our civilization is imminent. Also, no power on earth could ever change the rate or speed at which the sun orbits on ecliptic to the center of galaxy. In Section 7.4, we discuss the reasons why the weather forecasts are not accurate at all times.

In Chapter 8, we focus on black holes and the origin of the universe. In Section 8.1, we explain that black holes do not have super gravity. Many scientists have claimed that black holes are massive with a super gravitational field in which light is trapped. We believe that light does not escape from black holes because it is absorbed. We provide a formal proof of our theory. Also, we believe that the universe is neither expanding nor contracting because the space of the universe is boundless. If we state that the universe is expanding, it implies that we know there is something outside the limit because it must expand into space that was either occupied previously or created by the expansion. There is no evidence which proves that such an expansion is observed inside of our galaxy. It is not obvious how the selective expansion of the universe could occur outside our galaxy. Our prognosis about the observed red-shift of celestial objects, such as other galaxies and supernova is correct because they are moving away (receding) to maintain the balance between gravitational effects and centrifugal force. Thus, it is essential to redefine Hubble's constant in his law for the three dimensional movement of celestial objects. Next, we suggest that the mapping of the sky should be partitioned into past, present, and future universes, according to the separation of celestial objects from our earth and the solar system. In Section 8.5, we discuss the ultimate fate of our solar system after all of the hydrogen is transformed into helium at the sun's core through the thermonuclear burning process. In Section 8.6, we explain why the planets Venus, Uranus, and Pluto, rotate from the east to the west on their axis instead of the west to the east motion of the Earth, Jupiter, Saturn, and other planets. In Section 8.7, we explain why the orbits of comets are asymmetric. In the final section of this chapter, we look at some of the advances in modern physics, such as the String theory and new dimensions.

In Chapter 9, we discuss the ways to bridge the gap between the classical Newtonian mechanics and quantum mechanics. In Section 9.1, we revisit the outcome of Young's double-slit experiment and the behavior of a quantum particle electron in a shell orbit, by applying the principles developed by Erwin Schrödinger. In Section 9.2, we analyze the discrete model for radiation from the surface of a black body invented by Max Plank. We show that the quantum of energy possessed by the light wave, Plank's constant **h**, is inherited from the parent particle. Therefore, **h** is property that is associated with the quantum particle electron and not the fictitious particle photon. In this chapter, we establish that the quantized model to characterize black body radiation, from Plank, should not prohibit us from proving the wave as the only model for light and radiation energy. In Section 9.3, we discuss an important contribution to quantum mechanics, from a somewhat less recognized physicist, Paul Dirac. His ideas were instrumental in the prediction of the existence of the complementary particle, pair proton, anti-proton, electrons, and positrons. Also, his equations validated many different concepts and theories, such as Pauli's theory and the hole theory of atoms. In Section 9.4, we address the main objective of this chapter, to connect classical mechanics and quantum mechanics. We achieve this objective by explaining the operation of

quantum devices, based on Schrödinger's equations. In Section 9.5, we discuss the practical application of quantum mechanics by looking at an example of the scanning tunneling microscope. In Section 9.6 we describe the applications of quantum mechanics as a solution of complex problems, such as finding material that exhibits super conductivity at and near room temperature.

Further information and details about the topics discussed in this book can be obtained at the web site **http://www.Matrixwriters.com.**

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Contents

Preface		**……**	**vii**
Acknowledgments		**……**	**xiii**
Contents		**……**	**xiv**
List of Tables		**……**	**xvii**
List of Figures		**……**	**xviii**
Prologue		**……**	**xix**
1.	**Introduction**	**……**	**1**
	1.1. **Light: Wave or Particle?**	**……**	**4**
	1.2. **Accelerating Elevator Experiment**	**……**	**4**
	1.3 **Deflection of Light from the Star by the Sun**	**……**	**7**
	1.4 **The Michelson's Interferometer**	**……**	**12**
	1.4.1 **Analysis of Path Lengths and Delays**	**……**	**14**
	1.4.2 **Sky's Improved Interferometer**	**……**	**17**
	1.5 **Advocates of Particle Theory and Experiments**	**……**	**19**
	1.5.1 **The Photoelectric Effect**	**……**	**20**
	1.5.2 **Short Wavelength-Limit X-Rays**	**……**	**23**
	1.5.3 **The Compton Effect**	**……**	**27**
	1.6 **Light is a Wave: Proof & Experiments**	**……**	**27**
	1.6.1 **Doppler's Shift**	**……**	**27**
	1.6.2 **Rotation of Fan Blades & Skin Effect**	**……**	**29**
	1.6.3 **Bright and Dark Sides of Planet**	**……**	**31**
	1.6.4 **More Examples**	**……**	**32**
	1.7 **Summary**	**……**	**32**
2.	**Physics of Light and Electromagnetic Waves**	**……**	**34**
	2.1 **The Speed of Light and Electromagnetic Radiation**	**……**	**35**
	2.2 **True meaning for Speed of Light c**	**……**	**39**
	2.3 **Absolute Time**	**……**	**41**
	2.4 **Passage of Light through a Prism**	**……**	**42**
	2.5 **Properties of Waves and Particles**	**……**	**44**
	2.6 **Energy Content of Light Waves**	**……**	**46**
	2.7 **Revised Energy Computations for Nuclear Reaction**	**……**	**47**
	2.8 **Infrared Energy and Vibrations in Atoms**	**……**	**51**
	2.9 **Temperature profile of the Sun**	**……**	**52**
	2.10 **Summary**	**……**	**56**

3.	**Postulates: Relativity Basics ……**		**59**
	3.1	**Principles of the Special Theory of Relativity from Einstein ……..... **	**60**
	3.2	**Principles of the General Theory Relativity from Einstein...…….. **	**61**
	3.3	**Skylativity®: Sky's Theory of Special Relativity……. **	**64**
	3.4	**Skylativity®: Sky's Theory of General Relativity…… **	**66**
	3.5	**Maxwell's Field Equations for Varying Speed of Light…… **	**69**
	3.6	**Effect of New Postulates on Einstein's Field Equation……. **	**70**
	3.7	**Summary…… **	**72**
4.	**Limitations of Einstein's Special Relativity……. **		**74**
	4.1	**Edison's Light Bulb……..… **	**75**
	4.2	**Mass of Tungsten Filament in Edison's Bulb…… **	**76**
	4.3	**Energy and Mass Paradox for Matter…… **	**77**
	4.4	**Relativistic Mass a Complex Quantity…… **	**78**
	4.5	**Theory of Gravitation……. **	**79**
	4.6	**Time Dilation……. **	**83**
	4.7	**Gravitational Lensing…….. **	**87**
	4.8	**Summary…… **	**90**
5.	**Simplified Lorentz Transformations……. **		**91**
	5.1	**Lorentz Transformation & Virtual Time Dilatation……. **	**92**
	5.2	**Approaching System…… **	**93**
	5.3	**Receding System……... **	**95**
	5.4	**Summary…… **	**97**
6.	**Application of Skylativity® Theory to the Space Age ……..…..... **		**99**
	6.1	**Reallocation of particle collider Resources……. **	**100**
	6.2	**Universal Time, Length and Mass Scales…… **	**100**
	6.3	**Life Time of Neutrino……..... **	**101**
	6.4	**Quarks: Source of Energy for Future Weapons……. **	**102**
	6.5	**Future Space Expeditions……. **	**102**
	6.6	**Spacecrafts with Speeds above c……. **	**104**
	6.7	**NASA on the Right Track: Future Missions……... **	**106**
	6.8	**Summary……. **	**107**
7.	**Universal Unified Field Theory ……. **		**109**
	7.1	**UUFT: Integration of Gravity in Standard Model…….…… **	**109**
	7.2	**Reason for Gravity……..... **	**111**
	7.3	**Time Travel..... **	**116**
	7.4	**Weather Forecasts……..…… **	**118**
	7.5	**Summary……. **	**118**

8.	**Black Holes and Infinite Universe……..**		**120**
	8.1	**Black Holes & Fictional Singularity……**	**120**
	8.2	**Infinite Universe with Multiple Big-Bang Events……..**	**124**
	8.3	**Deterministic Case for Hubble Constant……**	**129**
	8.4	**Observable Universe Past, Present and Future……..**	**133**
	8.5	**Fate of Solar System & Our Civilization……**	**134**
	8.6	**Planets with Retrograde Axial Rotation……..**	**144**
	8.7	**Comet's Asymmetric Orbit……...**	**146**
	8.8	**String Theory and New Dimensions……**	**147**
	8.9	**Summary……**	**148**
9.	**Bridging Quantum Mechanics and Classical Mechanics……**		**150**
	9.1	**Revisiting Quantum Particle Behavior……**	**151**
	9.2	**Black Body Radiation & Quantum Ideas……**	**154**
	9.3	**Role of Dirac in Quantum Electrodynamics ……...…….**	**161**
	9.4	**Connecting Classical Mechanics & Quantum Mechanics…….**	**167**
	9.5	**Real Life Applications of Quantum Mechanics…….**	**170**
	9.6	**Future of Quantum Physics…….**	**171**
	9.7	**Summary……...**	**173**
A	**APPENDIX: Electromagnetic Frequency Spectrum……. ….**		**174**
B	**APPENDIX: The Greek Alphabet & English Equivalent……**		**177**
C	**APPENDIX: Useful Numbers and Formulae……**		**178**
D	**APPENDIX: Glossary……**		**181**
E	**APPENDIX: History of Particle & Space Science……**		**195**
F	**APPENDIX: References and Suggestions for Further Reading……..**		**209**
	General Index …….		**218**

List of Tables

Table 1.1	**Frequency of light waves vs. Maximum KE of photoelectrons…….....**	**22**
Table 1.2	**X-ray emissions vs. cutoff frequencies at different eV acceleration.....**	**25**
Table 1.3	**Maximum frequency of X-ray vs. accelerating potential of electrons .**	**26**
Table 2.1	**Light wavelength λ (10^{-9} m), frequency ν (10^{12}) , period (10^{-15}) and coefficient σ_{water} …….**	**36**
Table 2.2	**Full Electromagnetic Spectrum Table…….**	**37**
Table 2.3	**Optical Radiation Spectrum Table……..**	**37**
Table 2.4	**Radio Wave Spectrum Table ……...**	**38**
Table 2.5	**Particle Interaction Forces……...**	**39**
Table 2.6	**A theoretical model for the Sun……**	**53**
Table 8.1	**Energy of particles, the early universe as predicted by GUT ……...**	**125**
Table 8.2	**Distance measuring techniques and range……..**	**132**
Table 8.3	**Approximate mass and charges on quarks……..**	**137**
Table A	**Electromagnetic Frequency Spectrum…….**	**174**

List of Figures

Figure 1.1	Radiation event: Orbiting electron in excited state……..	3
Figure 1.2	Path of light from flash-light in an elevator……..	4
Figure 1.3	Observed position of a star is affected by the Earth's orbital rotation ……..	6
Figure 1.4	Position of the star is affected by bending of light…….	10
Figure 1.5	Michelson's interferometer……..	12
Figure 1.6	Path of light in the direction of the Earth's orbit……..	15
Figure 1.7	Michelson's interferometer: Reflected Light path……	17
Figure 1.8	Sky's Apparatus: Single Shot Interferometer……	19
Figure 1.9	Photoelectron emissions by incident light on a clean metal surface …….....	21
Figure 1.10	Maximum KE of photoelectrons vs. frequency of incident light……...	22
Figure 1.11	Radiation event caused by collision of high energy electrons…….....	23
Figure 1.12	Bremsstrahlung spectra: electrons of various energies striking a metal target…….	24
Figure 1.13	Maximum frequency of emission vs. accelerating voltage…….	26
Figure 1.14	Rotation of fan blades coated with photo-sensitive material……	29
Figure 1.15	Details of charges on a pair of fan blades exposed to beam of light…….	30
Figure 2.1	Measurement of True Speed of Light c……..	40
Figure 2.2	Passage of light through a prism pair……..	42
Figure 2.3	Theoretical model of the sun's interior……...	54
Figure 2.4	Changes in hydrogen and helium concentration within the sun……...	56
Figure 3.1	Albert Einstein with Rabindranath Tagore from India…….....	62
Figure 4.1	Simple incandescent light bulb…….	75
Figure 4.2	Buckets with atoms on a wheel experiment……..…….	82
Figure 4.3	Path of light in a moving spacecraft……...…….	83
Figure 4.4	Path of bullet fired in spacecraft……..	85
Figure 4.5	Effect of Gravitational Lensing: stellar parallax technique……..…	89
Figure 5.1	The speed of light constant c, Lorentz transformation of a world point P…..	91
Figure 5.2	VSL, approaching scenario: Lorentz transformation of world point P……..	94
Figure 5.3	VSL, receding scenario: Lorentz transformation of world point P…….	96
Figure 7.1	Structure of atoms: Strings beyond quarks…….....	115
Figure 8.1	Solar Systems. ……..……	127
Figure 8.2	A Parsec: Largest unit of distance measurement commonly used by astronomers	130
Figure 8.3	Thermonuclear fusion of hydrogen into helium, 3 energy release steps……..	136
Figure 8.4	Structure within an atom down to fundamental particles quarks…….....	138
Figure 8.5	Sense of rotation of the planets on their axis, masses and orbital period compared	145
Figure 9.1	Simulated black body radiation……..…….	155
Figure 9.2	Intensity of black body radiation versus wavelength at three temperatures...	156
Figure 9.3	Experimental results of black body radiation……..…….....	157
Figure 9.4	Allowed energy levels for an oscillator with frequency f……...	158
Figure 9.5	Plank's model: Intensity vs. Wavelength ……..…….	159
Figure 9.6	Basic arrangement of Scanning Tunneling Microscope……	170

Prologue

This book is about the true science of light. Many physicists from the beginning of time have failed to recognize the clear understanding of the exact nature of light as it relates to different events, either occurring naturally or created by human efforts. They have portrayed a sense that light behaves as waves in certain events and occasionally it behaves as particles. This ambiguous description of light pondered pioneer physicist Albert Einstein to formulate complex concepts of relativity theory and gravitational theory. Subsequently, renowned physicists, such as Richard Feynman, Roger Penrose, John Wheeler, Charles Misner, Stephen Hawking, and Kip Thorne, extended Einstein's principles to explain the mysteries surrounding distant celestial vast objects, black holes. In their discussion, they and physicist Stephen Hawking have inadvertently stated that black holes have super gravitational fields. From our point of view, light behavior is simple and straight forward in the sense that the rules of Newtonian classical mechanics may be applied without incorporating any special treatment for light. Therefore, black holes absorb light similar to a perfect black body. Further, the behavior of light can be very accurately characterized as a wave, regardless of the type of event. Very close examination of all the experiments performed to prove that light is a particle in those events, could very well be understood if it is modeled as wave.

One of the greatest strengths of this research is that the principles explained in this book provide a rather simplistic view point for several phenomena of complex nature, such as the bending of light caused by refraction as it passes to the medium and time dilation effect experienced by the very high speed moving objects. Our view point extends the ideas suggested by the Portuguese physicist, João Magueijo, a research fellow in theoretical physics at Cambridge University. We have taken one step further, proving his ideas of the Varying Speed of Light (VSL) to be correct. When our concepts are verified, you will gain a clear understanding and explanation of the events related to light, by applying the basic principles of atomic physics described in the book. Here, we have achieved success by taking advantage of the modern techniques and advances made by particle physicists. These physicists formulated the standard model, and the quark extension to the standard model, to describe all of the elements on the periodic table that are found in nature and artificially created. We have provided answers to many questions about the creation of the solar system and the universe that were not answered by previous creation theories, such as the big-bang.

Our theory of relativity, postulated by Mr. Kadakia, designated **Skylativity®**, comes from a simplification of many computations related to sky and the universe, and presents the results with higher accuracy than before. It leads to the formulation of the Universal Unified Field Theory (UUFT), and provides time and space invariant scales for length, time, and mass measures, for every frame of reference. You will discover that Einstein took a risk when he formulated his famous theory of relativity by making unrealistic assumptions. When he stated that time measured in different inertial systems by identical clocks would differ, he ignored the fact that the identical clocks ceased to remain identical in design, when they were stationed in each of the inertial systems. Further, he assumed that the speed of light is a

constant in James Maxwell's field equations. More recent advances in technology have verified that the speed of light has varied since the beginning of time and it varies according to frame of reference like an ordinary particle obeying the laws of Newton's mechanics. Our sense of accomplishment and quest will be complete when dedicated physicists and astronomers redirect their resources to promote the ideas of this book and to build a solid foundation for future space expeditions.

8.

Black Holes and Infinite Universe

In previous chapter we explained the procedure to incorporate effect of force of gravity on subatomic particles and standard model. We declared that effect of weak gravitational force is very feeble to be ignored in comparison with force of electric charge. We were able to develop universal unified field theory that connects Newtonian mechanics applied to model behavior of huge celestial objects and Quantum mechanics applied to model behavior of subatomic particles with complete consistency. Then we explained fundamental reason behind the force of gravity. The rotational inertia of objects creates force of gravity. For stability reasons force of gravity from first object is balanced by centrifugal force when another object rotates surrounding the first object. We stipulated that antigravity can't exist in nature without intervention of any means created by engineers to overcome force of gravity. Then we touched base with topics of future space expeditions and consideration in design of space vehicles travelling at speed that is comparable to speed of light. Next we discussed that time travel is not possible and we stated various reasons. Next we mentioned the cause of imperfect forecasts of the weather.

In this chapter our focus will be to explain black holes. We shall explore why light and other radiation energy waves seemingly do not return when directed towards black-holes. We shall show that claims of Steven Hawking and others about super gravity possessed by black holes that traps the light waves does not make sense. Next we shall discuss theories behind creation of our universe. We shall show that it is more probable that universe is created as a result of more than one big-bang event as opposed to current theory of single big-bang explosion. .We shall prove that Universe is neither contracting nor expanding as claimed by Hubble and others. In Section 8.3 we shall demonstrate that it is not sufficient to describe Hubble Constant in one dimension. In section 8.4 we shall examine the limits of observation within the universe. It turns out that only a very small size of universe in our neighborhood can be observed in real-time. Rest of the Universe is observable in past tense. Therefore the maps of universe should be partitioned in three segments past, present and future. We shall discuss various observable segments based on timelines we receive information from the parts of universes. Next we shall see the future of space science in a realistic scenario.

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8.1 Why black holes may not be dark at all?

In early 1970's existence of black holes were first verified when scientists received X-ray burst from Cygnus-1 binary system of stars. The burst of X-rays were flickering at time scales of one hundredth of a second [17]. Since then lot of research has been done to detect variety of black holes found in universe. Black holes are classified into three major groups, Super massive with masses in excess of 10^6 to 10^9 Solar masses those found at the center of galaxies, mid massive size of 500 Solar mass such as M82 and primordial black holes of size of earth to as small as 5 X 10^{-8} Kg as proposed by Steven Hawking from Cambridge University. Of these three types existence of primordial black holes is not verified in nature. For large size black holes three numbers completely describe structure of a black hole, its mass, total electric charge and its angular momentum. Scientists claim that at the time of formation of black holes electric charge on black holes would disappear by process of neutralization. They also claim that black holes are free of magnetic field. These assumptions are not correct. In the following discussion, we shall attempt the following unanswered questions as it relates to black holes with massive gravitational forces that traps even light waves. Though current theory which claims that black holes have super gravity field explains accretion disk formed surrounding the black holes as matter form neighbor star is pulled it does not explain the following mystery questions.

a. Why trajectory of light waves just outside event horizon is not circular?
b. How the matter inside black holes has density higher than the densest mineral found on the earth?
c. How could self gravity force of black holes overcome strong forces residual and electric charges to compress neutrons and protons beyond current levels of density? (We shall see that black holes should meet this requirement to support current theory).
d. Why black holes are charge neutral?
e. How black holes will evaporate if even light from its surface can't escape?

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8.2. Creation of Universe One Big-Bang event or several?

The science that governs the creation and fate of the Universe is known as Cosmology. As per present state of art it is believed that Universe was formed as a result of single big bang event. Also it is believed that since the time our Universe is created it is going through expansion phase. Means our Universe is continuously expanding. This fact was discovered by Hubble the first time. He noticed that the Red shift of light arriving from distant galaxies is always indicating that they are moving away**. The rate of recession or z-shift is proportional to the velocity of recession.** He summarized his findings into his famous law and expressed in a relationship

$$v = H_0 X d \qquad (8.4)$$

where v is recessional speed of galaxy,
d is distance
and H_0 is Hubble's constant.

We firmly believe that fabric of space itself can't contract or expand nor it can move. Only matter or object within space can change their volume or position. Therefore Hubble's law requires modification. He should state that galaxies are moving away from each other and away from our solar system. Hubble explained the expansion of Universe by comparing analogy of expanding Balloon. He said the size of coins on balloon does not expand. Similarly objects within galaxies do not expand. This adds error to his proposed law. Actually if you see the coins will be expanding too if one blows the balloon and examines expansion of surface of the balloon closely. We find that fabric of space within our galaxy does not seem to expand to any appreciable extent. Side effect of Hubble's law is that cosmologist believes that Universe was formulated from a point and it expanded into multiple celestial objects by a single big-bang explosion event.

We have a different school of thought, when it comes to origin and creation of Universe. We believe that space in Universe always exist because expansion of space of Universe assumes that there was space into which space of Universe is expanding into. At the beginning Universe is unbound, untimed and infinite. Meaning Universe has no boundary and there is no time that is known when the Universe came into existence. As the time elapsed various celestial objects in Universe were formed depending on suitable prevailing circumstances. Further we believe that distant galaxies, black holes, Nebulae, Quasars and Supernova were born because of multiple explosions and not one big-bang event. As a result of one of the big-bang event our solar system formed approximately 4.5 Billion years ago. Because of uncertain knowledge about origin and creation of Universe, does it make sense to ask question when the Universe ends. No because our Sun will die much before the end of

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our Universe. It is estimated that our solar system will collapse when the sun cools off and becomes a cold white star like a dwarf. This will happen approximately after 4.5 Billion Years. Our belief is that even after death of our sun and solar system the Universe will continue to exist. Therefore it may be imperative to invent systems that will allow prolonging and sustaining life on planet earth as it exists today and in the distant future.

We believe that Big–Bang theory for creation of Universe raises many controversial questions that contradict itself. It suffers from an unanswered paradox of what we describe as thermal inertia discrepancy. For instance the time lines, temperature and energy of particle after creation of early universe in Planck time predicts unrealistic cool down profile for the Universe. In Table 8.1 we have described time lines, temperature and particle energies projected by Grand Unified Theory (GUT) after Planck time in early Universe after Big-Bang event [17]. The Grand Unified Theory of forces is also known as theory of everything as it claims to unite effects of strong, electromagnetic, weak and gravitational forces. From the table data in temperature column it is evident that it would require almost zero time constant and zero thermal inertia for the Universe for temperature to drop at those values. It is not obvious and cleat that at those particle energies how the heat among particles will be exchanged to realize the drop in temperature. Further the energy from universe was depleted or dissipated into what environment as a result of loss of temperature. There is no account or answer to the energy loss from the early universe in GUT. As we shall see later that it takes almost 4000 years for light wave energy (photon described by Einstein's relativity) developed as result of thermonuclear fusion at Suns' interior to escape from the Sun. The drop of temperature in Universe predicted by GUT in the case of Big-Bang does not make sense in that kind of timeframe if computation of light and energy from the sun is occurring at very slow rate.

Table 8.1 Energy of particles, the early universe as predicted by GUT

Time after Big-Bang	Temperature of Universe	Energy of Particle
10^{-43} S	10^{32}K	$>10^{4}$ GeV
10^{-35} S	10^{27}K	10^{4} GeV
10^{-12} S	10^{15}K	10^{2} GeV
10^{-6} S	10^{13}K	1 GeV
2 S		Universe transparent to neutrinos
3 Minute		Helium produced in the Universe
3 X 10^{5} Years		Universe transparent to light
5 X 10^{17} S	3 K	At present

In order to determine the age of the universe, scientists measure the change in frequency of a photon popularly known as red shift z. Also, it is determined that the red shift increases as the universe expands and decreases if it undergoes contraction [17]. We agree that the frequency of light would change if the size of universe would change. We disagree that space within our universe expands or contracts. Only matter contained in space will

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expand or contract depending on enthalpy (heat content) and entropy (degree of measure of orderliness) changes in the system. This school of thought is consistent with a belief that when any system or components of system moves with certain speed does not imply that space occupied by the system moves. It does not make sense to say that space has moved. We would like to describe the effect of speed of light changes on distance measurements. Scientist's measure the time of flight (round trip) taken by light wave arrived from distant celestial object in galaxy to calculate the distance. If the distant star is receding or approaching at speed Vs, the relative speed of light should be c + Vs (approaching object) and c – Vs for (receding object) should be used for computations respectively by applying Galileo transformation instead of using fixed value c. When distance between source of light and moving target is changing a virtual shift in reflected light signal from the moving target is observed. The apparent shift was first invented by Doppler, corresponds to the speed of target that is different from a non-moving target. Further the relative speed of light to the moving target is modified by the same amount.

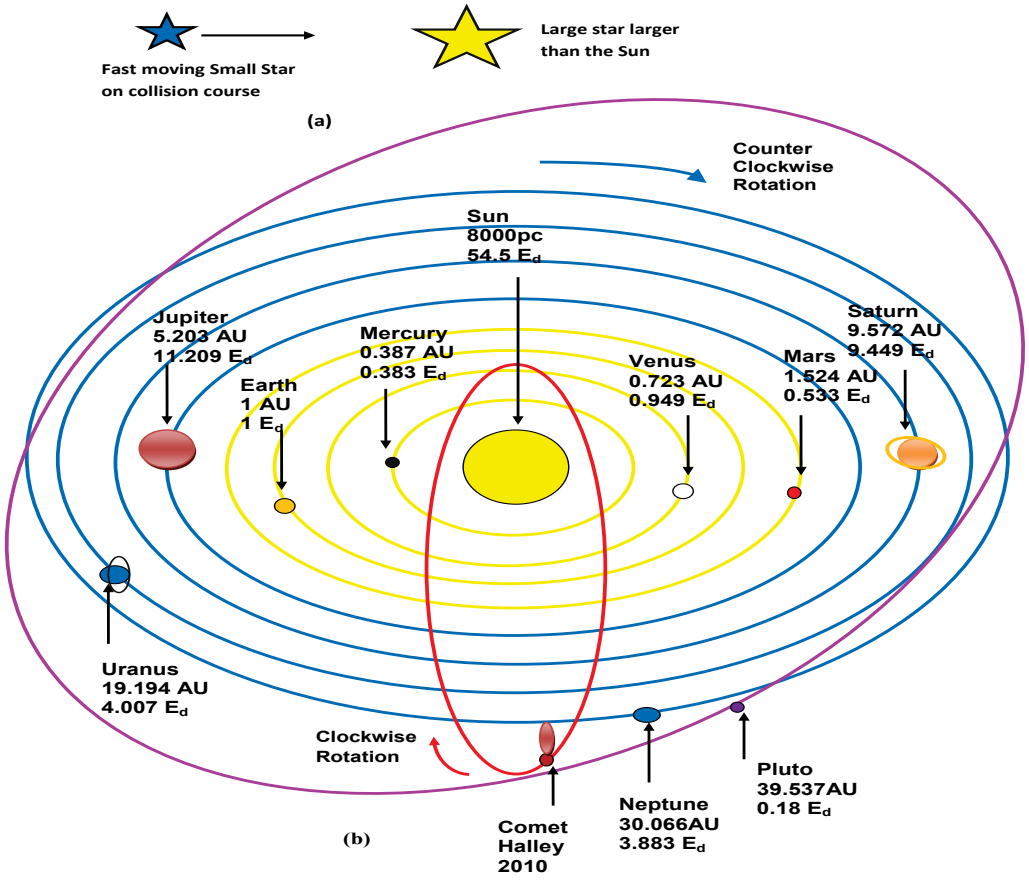

Figure 8.1 **Solar Systems**. Size of planets in earth's diameter (E_d) and average orbital Distances in average distance from earth to the sun = 1 AU (a) Event causing birth of solar system (b) Solar system, distance of planets from the sun and size of planets in diameters of earth

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8.5. How long our solar system will survive?

As stated before our Son and solar system and the Sun were born approximately 4.5 Billion Years ago. It is probable that a smaller star collided with a big star and result is our Son and planet system. For hundreds of years scientists are trying to answer when our Solar system, the Sun and our civilization will cease to exist. The present estimate from Chandrasekhar and others are approximately after another 4.5 Billion years our Sun will become a cold white star or dwarf [26]. Also scientists were unable to answer if mass of the sun is depleting as a result of loss of Billions of Watts of radiation energy into space. Further it was not clear what process sustains the loss of radiation energy from the Sun. Einstein's mass energy conversion equation inspired astronomer to answer the question that they thought was brilliant. Astronomer now believe that at very high temperature 15 Million degrees Celsius Hydrogen atoms in ionized state are fused together to form Helium atoms at the core of the Sun. This fusion process is known as thermonuclear burning of Hydrogen into Helium. This is described as a three step process [17]. According the description of the reaction 0.7% of mass of Hydrogen atom is converted into radiation energy. Astronomers explained the vast amount of energy released from the Sun by applying Einstein's famous equation $E = M \times c^2$. As per this equation small mass is transformed in huge amount of energy. Still 0.7% of mass conversion for each formation of Helium atom is a very high fraction. What puzzled Shailesh Kadakia was if mass of the Sun is changing because of loss of energy by radiation, why the earth's period of rotation surrounding the Sun is not affected for past several centuries? Therefore thermonuclear fusion and burning of Hydrogen into Helium atoms and, mass lost from conversion of electron into energy is not satisfactory explanation for the luminosity of the Sun.

The answer comes from Third postulate of special **Skylativity**®. We claim that whenever radiation event occurs it happens because electrons of gas atoms in high potential energy state make a transition to low potential energy state. There is no conversion of mass into energy during emission of radiant energy.

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Theorem: Mass Conservation in the Universe

Matter inside white stars such as the Sun can neither be created nor can it be destroyed in-spite of loss of billions of watts of radiation energy per second. Mass of white star the Sun always remains constant unless a portion of its mass is dislocated by another star on a collision course. The self force of gravity of the Sun prevents leaking of atoms into space (vacuum) though the surface temperature of the Sun is as high as 5800 degrees Kelvin.

Proof: The basis for proof of above theorem lies in the roots of Newton's law of gravitation and Newton's form of Keppler's third law. According to Newton force of gravity among two objects is proportional to product of their masses and inversely proportional to square of distance of the centers of gravity of both objects. The proportionality constant G was Known as Universal constant because the law hold in the Universe and it holds for any and object of every size in the our Universe. Semantically

$$F_g = G\,(M1 \times M2)/\,R^2 \qquad (8.8)$$

It is well known fact that measured Solar year period or time required for earth to complete one rotation surrounds the sun is observed to be constant for past hundreds of centuries. Both tropical year and sidereal year periods have not been deviated from their values by the smallest fraction of a second over centuries. From Newton's form of Keppler's third law which relates sidereal period and masses of rotating objects, it is clear that if period is constant implies that mass of the objects should be constant if semi-major axis is constant. The formula for side real period for earth orbit surrounding the sun from Keppler's law is as follows.

$$P^2 = [4\pi^2/G(M1+M2)] \times a^3 \qquad (8.9)$$

Where P = Sidereal period of orbits in seconds
a = Semi-major axis in meters
M1 = Mass of first object in Kilograms
M2 = Mass of second object in Kilograms
G = Universal Constant of gravitation = 6.67×10^{-11}

To prove our theorem we must prove that sidereal period of the earth's orbit surrounding the sun does not alter over period of many decades. If measured value of sidereal period for year after year does not change (increase) by 100 picoseconds per year would imply from above two equations that the mass of the sun is not lost according to special relativity prediction from Einstein. How we have arrived at the magic number of 100 picoseconds will be evident shortly.

In the following we shall formally validate our theorem by comparing computation of changes in sidereal period of earth's orbit to the measured experimental value. To accomplish our objective first we shall compute the total mass that is lost per second from the sun in thermonuclear burning of Hydrogen into Helium that will generate power on the sun to

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achieve measured luminosity. We shall utilize famous equation $E = m \times c^2$ to compute loss of mass equivalent of energy from the sun because of mass to energy conversion. It turns out that in Fusing Hydrogen into Helium, Six Hydrogen isotopes are needed to be fused together to form one Helium atom and two Hydrogen atoms along with γ ray energy is released as a result of annihilation of two electrons and two positrons. One fact that is obscured about thermonuclear burning of hydrogen into helium is when two (light weight) hydrogen isotopes are fused together, the mass of combined one ^2H isotope one proton and one neutron (neutron mass = 1.67493×10^{-27} kg) is higher than mass of 2 ^1H hydrogen isotope (protons mass = 1.67262×10^{-27} kg) that started the reaction, plus the fusion releases a positron. This does not make sense (see Figure 8.3).

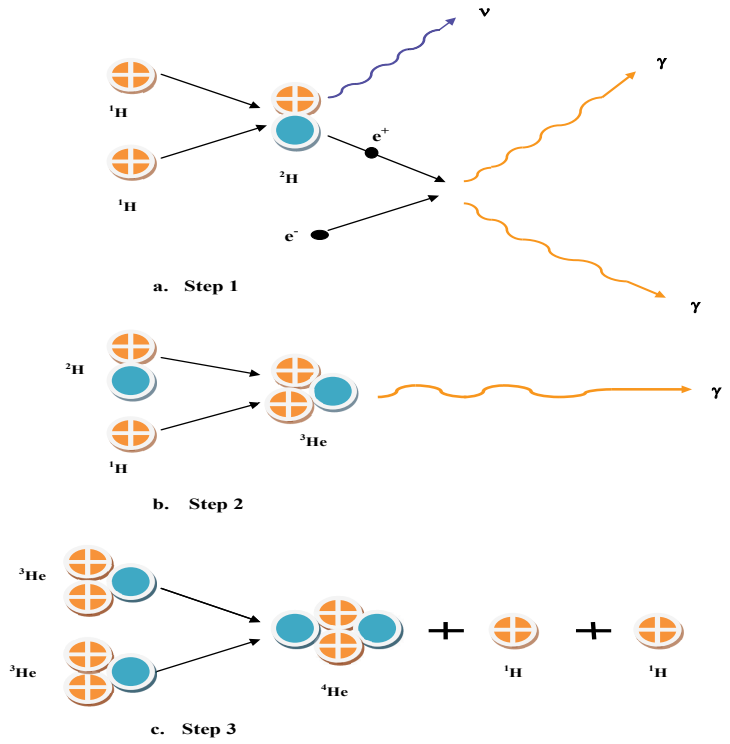

Figure 8.3 Thermonuclear fusion of Hydrogen into Helium, 3 energy release steps. (a) Two protons fuse to form isotope of Hydrogen. (b) Two protons fuse to form isotope of Hydrogen. (c) Two ^3He nuclei collide to form ^4He isotope & two protons.

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8.6. Why some planets orbits from East to the West?

Before we can explain the opposite axial rotation of planets Venus, Uranus and the Pluto, let us explain why planet like earth rotates on their axis in addition to orbital rotation surrounding the sun. As per our explanation, Solar system and our planetary system were formed as a result of collision of two stars approximately 4.5 Billion years ago. At that time all of the planets must be in gas form like our sun is now. Because the planets were small there was no way thermonuclear burning of hydrogen atom into helium atom process would happen, a process that is occurring on the sun. Therefore the temperature of planet's surface and interior started dropping. The planets receded to the distant from the sun to obey laws of gravitation and started orbiting surrounding the sun. They were inhibited by moving further away by two balancing forces inward gravitational pull and outward centrifugal force because of their orbital speed. Essentially their orbit radius was determined by the escape velocity as computed by formula of ordinary mechanics.

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8.7 Why Comet's orbit is skewed?

Comets have been an object of astronomer's interest for its unique orbital motion since early 17^{th} century when English astronomer Edmund Halley in 1705 first spotted famous Halley's Comets named after him. He applied Newton's theory of gravitational perturbation to calculate orbital period of Comets and concluded that one of the reason for asymmetric orbit of comets is the force of gravitation from planets Jupiter and Saturn. Since the discovery of Halley's Comet few other Comets Borrelly's, Shoe maker-Levy 9 and Hale-Bopp have been found. More recently four comets have been visited by NASA's spacecraft ICE passed through the tail of Comet Giacobini-Zinner in 1986 and Commet Grigg Skjellerup in 1989. Another spacecraft DS-1 imaged nucleus of Comet Borrelly in 2001. In 1986 five spacecrafts from the USSR, Japan, and ESRO visited Comet Halley. Of all the Comets, Comet Halley's orbital period is regular and the average is 76 years that could vary as much as 79.3 years between the years 239 BC to 1986 AD. Even for Halley's Comet one can't compute the dates of reappearance by simply subtracting multiples of 76 years from 1986 for the above mentioned variations. The next appearance of Comet is anticipated to be in early 2062. In the following we shall examine reasons why orbits of Comet's are so much elongated.

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About the Author

Shailesh Kadakia originally from Mumbai, India earned his graduate degree MSEE in Electrical Engineering with emphasis on computer technology from the University of Texas at Austin in May of 1981. He was awarded the National Science Foundation funding for research and thesis completion. From 1981 to 2001, Shailesh was employed as an Information Technology Engineer in several blue chip manufacturing corporations. During his 20-year IT career, he was issued five patents in computer technology (circuits and systems), and had published over 25 reports and papers in journals. He contributed toward the successful completion of VLSI projects at IC vendors National Semiconductor, Fairchild, Texas Instruments, Cirrus Logic, Motorola Semiconductor, Hewlett Packard, LSI Logic, Silicon Graphics, Entropic Communication and NxtWave Communication.

From 2003 to 2007, he directed his attention from the IT industry to the investment industry. During his three year career at MetLife Insurance and Primerica as an investment executive, he educated himself on financial and corporate management practices and laws. Simultaneously, he did extensive research and studies on relativity theory that lead to the creation of this book. Then, he founded start-up corporations Krypton Security Systems, Inc. on his own and MicroLink Inc. in partnership with an MIT graduate from Mainland Sam Tang. For proposing the idea of Smart Card for nation security, Shailesh was awarded Business Man of the year 2005 award from NRCC. From June 2008 to June 2009, he accepted employment at Harris Corporation's RFCD Division, Rochester, New York, as a Software Engineer Level 3. At Harris, he was routinely testing the Flacon III family of Soft Defined Radios designed for the U.S. defense department.

Shailesh is listed as an honored life member in the Cambridge Who's Who directory and is on the professional network of LinkedIn (http://www.linkedin.com/in/shaileshkadakia). His outside interests include swimming, sight-seeing, singing and spending time with friends. His favorite sports are tennis, volley ball and bowling. In the indoors, he likes to watch football, ice hockey and basketball, play chess and play billiards. Also, to relax, he likes to cook, visit Ellison Park, Rochester. He likes the people and community of Rochester where he is currently residing.

Finally, he enhanced the theory of relativity proposed by famous physicist Albert Einstein and complemented his work by postulating the new **Skylativity®** theory. He invites you to provide your feedback and comments on the subject matter of this book on his web site www.Matrixwriters.com. He will incorporate your suggestions when the next edition of the book is released.

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