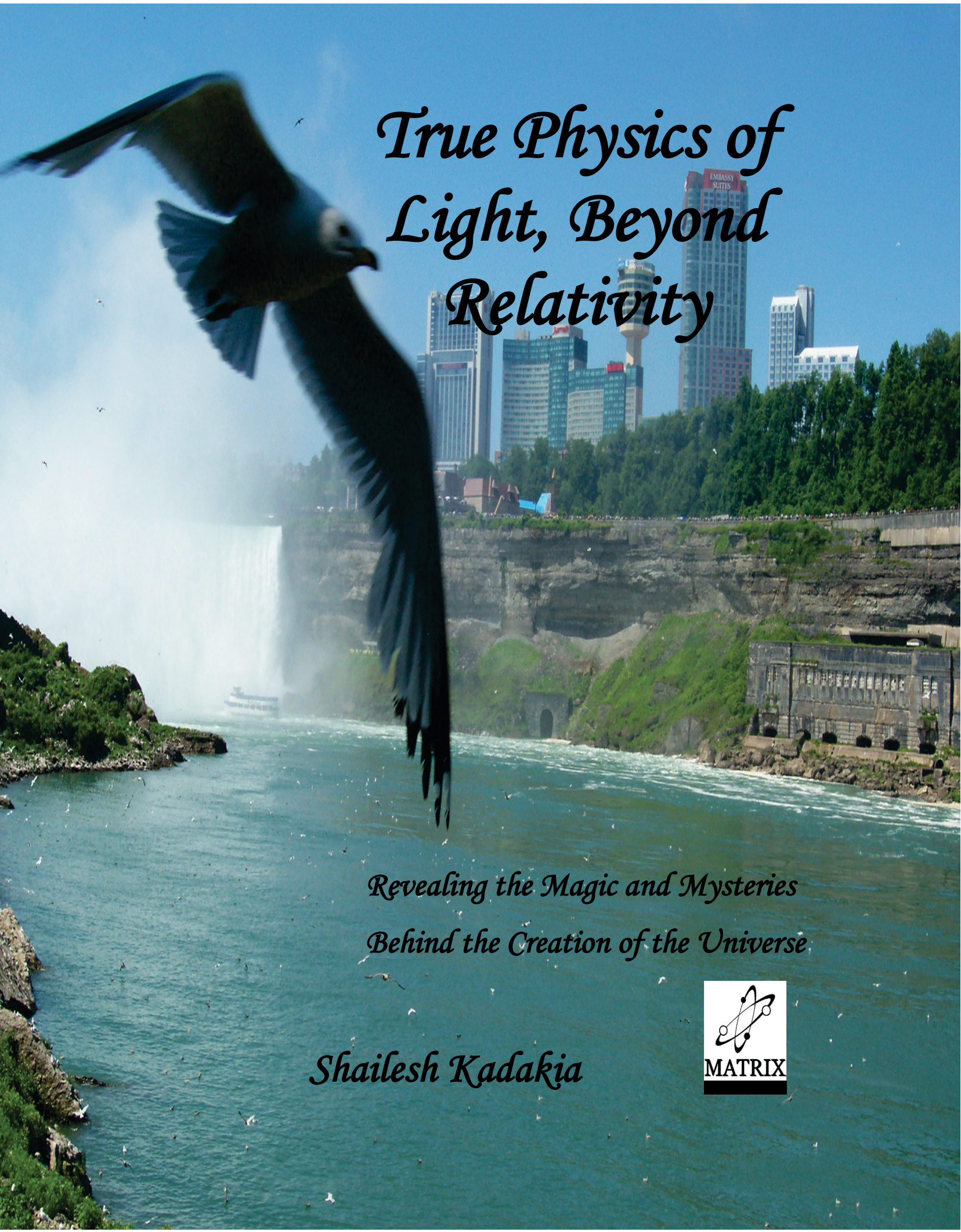

True Physics of Light, Beyond Relativity

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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With 40 illustrations of which 29 in Color

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True Physics of Light, Beyond Relativity

Shailesh R. Kadakia, MSEE, 602 Suburban Court, Apt. 3, Rochester, NY 14620 USA

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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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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.

2.

Physics of Light and Electromagnetic Waves

In this chapter our focus is to explain the fact that the speed of light and the speed of Electro-magnetic radiation are variable. Not only speed of light and EM waves depends on frame of reference, it also varies in different medium and different types of energy waves have different speeds. The speed of propagation of radio waves is different than c. We will show that speed of propagation for energy waves in entire range of frequencies of Electromagnetic (EM) spectrum can't be c.

In the section 2.2 we shall explain the true meaning of constancy of speed of waves in general and as it is applied to EM radiation including light waves. In the next section we shall describe concept of absolute time. In section 2.4 we will discuss passage of light through Newton's Prism and Calcite crystals to show that light energy wave can't be particles. Our conclusion is based on results of Prism experiment and path of polarized light thru Calcite crystals. In section 2.5 we will describe various properties those distinguish waves from particles.

According to present understanding, energy content of EM waves is computed by Max Planck's formula

$$\mathbf{E = h \times \nu} \qquad (2.1)$$

where h is Planck's constant. The value of Plank's constant is $6.63 \text{ X } 10^{-34}$ joule-second.

It is more commonly expressed as $4.14 \text{ X } 10^{-15}$ eV-second. We believe that this formula is not valid for entire range of frequencies of EM radiation spectrum a situation analogous to speed of propagation of EM waves. In particular, we will show that the formula should be different at very low frequencies of 1 Hz and lower than that value. Even speed of EM waves at those frequencies can't be as high as c. In section 2.6 we will describe an alternate method of specifying energy content of EM waves.

In next section, we shall concentrate on computation of energy release during nuclear reaction. We will show that famous formula for energy release computations suggested by the most celebrated scientist Einstein $E = m \times c^2$ over estimates the value for energy released during nuclear radiation event. The fact of the matter is the primary cause of energy release is the release of binding energy during a nuclear fission or a fusion reaction because atoms configuration is altered. Typically when a radioactive element such as enriched ^{235}U nucleus absorbs a slow moving neutron nuclear reaction occurs. The absorption of neutron causes

instability in atom that splits the atom into daughter atoms with vast quantity of binding energy release. An empirical expression for binding energy release during a radio-activity is included in the section. Einstein's formula for energy release $E = m \times c^2$ is good if the mass m is not the vanished mass but it is replaced by change in kinetic mass. The kinetic mass is mass equivalent of the kinetic energy. Also speed of light c should be a value that corresponds to true meaning of constant speed of light c. According to Bohr's model the light wave energy is released when electron changes its quantum state. The difference in energy levels of electron quantum state corresponds to light wave energy released. Therefore E predicted by Einstein's formulae provides for computation of only the light wave radiation energy. Next we are interested in understanding of temperature variation inside the core of the sun. Scientists have predicted very high temperature at the core of stars such as the Sun. The measured temperature is as high as 1.5×10^7 K. We believe that more data is needed to verify that such high temperatures values indeed exist. We will show that there are practical limits for such high temperatures. Therefore in section 2.8 we shall discuss the nature of infrared radiation and relationship of atomic vibrations with temperature of matter in active stars such as the sun. In the next section, we shall describe characteristics of temperature profile at the core of sun.

The main purpose of our focus in this chapter is to prove that radiation energy is waves that have distinct properties and can't be confused to be particle. On the other hand we also wish to prove that elementary particles such as electrons, protons, neutrons, quarks, collectively Leptons and Baryons can't be called waves. Though in some instances, their behavior may be better understood by wave model instead of particle model. For certain events modeling behavior of light as a particle increases ease of understanding weird behavior of light.

Read more…….

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Do you have amusing questions on Light? We have convincing answers

2.2 What is true meaning of speed of light a constant c?

Now there is an obvious question, what is the meaning of statement speed of light or EM waves is constant c? The value is $2.997924.58 \times 10^8$ m/s exact. Our understanding states that speed of light obeys Galileo transformation for different moving inertial systems. In a

preferred frame of reference where the distance between point of interest and observer does not change with respect to time, if speed of light is measured, its value will be always the constant c. We infer that distance travel by light in this frame of reference in one second time corresponds to speed of light c. When we look at our universe, such a frame of reference is not realized. Because all the celestial objects in the universe are constantly moving. The main cause is that the motion of objects is affected by gravitational force of the remaining objects in the universe. Luckily an extremely close approximation to such a frame reference may be found in the neighborhood of vast celestial objects. For instance source of light and measuring instrument both located such that they are under influence of huge celestial object earth's gravity would experience uniform equal acceleration. Therefore distance between these two objects may be considered invariant in finite time. To balance the force of gravity, celestial objects are revolving in orbits by their kinetic energy.

Next we will describe how to measure absolute speed of light c in a preferred frame of reference. In such a frame of reference speed of light is invariant with regards to space and time. In Figure 2.1 a situation is depicted where distance between source of light and observer is maintained constant. To establish that the distance between Source A and observer B is constant, we shall maintain distance between another reference point C and source A and distance between C and B is constant and equal. Also we insist that angle ACB is a right angle. Therefore spacing $AC = BC = C/2^{1/2}$. Then by Pythagoras theorem side AB spacing between source and observer AB is computed by $AB = (C^2/2 + C^2/2)^{1/2} = C$. Now that we have defined the exact meaning to true speed of light, it may be good idea to describe speed of light as a phasor. A phasor is vector which has amplitude and a phase to describe orientation. The phasor representation for light a wave is very convenient because it is travelling wave in space and it is time varying field in time. The light wave characteristics are no different than electrical charge field waves a situation analogous to electro-magnetic waves radiated through an antenna. One of the difficult aspects of light waves is to control the phase of light waves at the source that generates light waves. Nevertheless, we shall represent a light wave speed phasor as a sinusoid. We shall state that amplitude of sinusoid c is true speed of light and is constant in space and vacuum. Symbolically speed of light

Read more…….

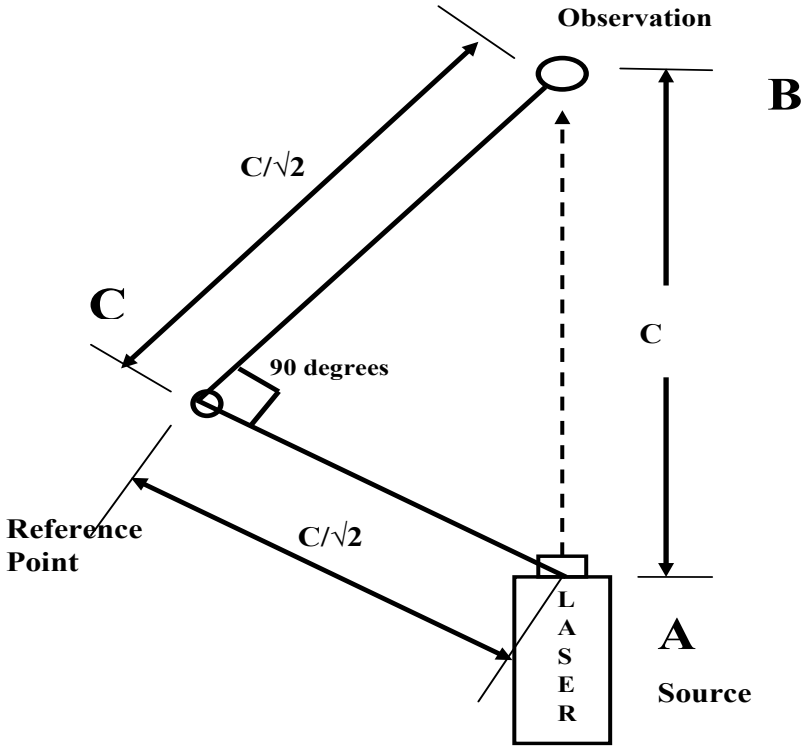

Figure 2.1 Measurement of True Speed of Light c

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2.4. Passage of Light Through a Prism

In this section, first we will describe the events of passage of light through prism. Next we shall explain polarization of light energy waves. It is interesting to note that the kind of polarization exhibited by light waves is not observed for any other energy waves. Even though many scientists have classified light waves as EM waves similar to Electrical and magnetic energy waves, there is a distinct difference. EM waves such as Electric and Magnetic waves they are sensitive to poles. For instance the field lines of magnetic energy starts from North Pole and tends to end at the South Pole and vice versa. The field lines of electric field static or time varying fields starts from a positive charge and ends at negative charge. This behavior of Electrical and Magnetic energy can be described as sensitivity to poles. Another way to put it is that the waves of this energy are polarized. The energy waves that show this field sensitivity tend to bend to complete their path. Therefore it is possible that electric energy or magnetic energy waves may bend by force of gravity. Although there is no evidence that these energy waves indeed bend by force of gravity. However light waves

do not have sensitive poles there is even smaller chances then electric or magnetic waves that it should be affected by force of gravity. We like to coin the term bipolarized energy waves for Electric and magnetic waves as each kind have bi-symmetric poles. North and South poles for magnetic fields and Positive +q proton charge or Negative -q on electron charge for electric field. Since light waves have no pole sensitivity but can have any plane of polarization, we shall call light waves as multi-polarized.

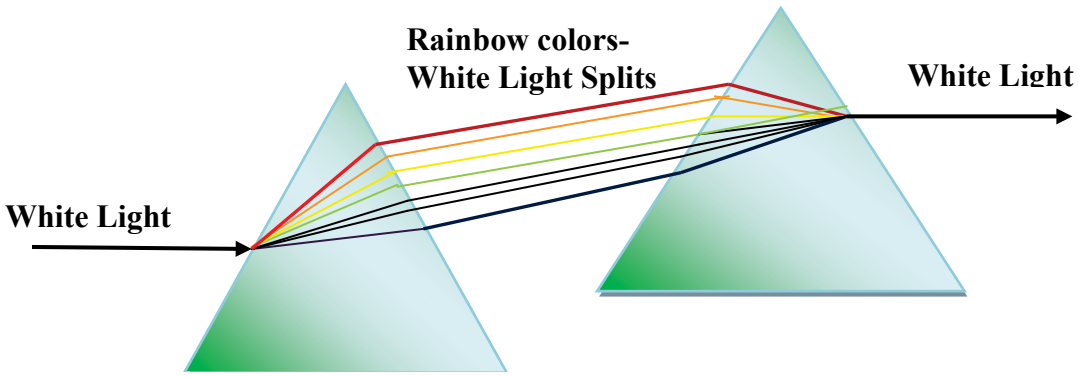

Figure 2.2 Passage of light through a prism pair. A beam of white light splits as it crosses boundary of medium from air to prism glass and recombines into white light when it crosses from glass to air outside the second prism.

Read more…….

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2.9. How hot the Sun's interior is?

Before we explore the details of process to compute temperature inside the core of the sun let us understand importance of prevailing high temperature need inside. We all know that existence of life and survival of our solar system heavily relies on the fact that the sun continue to provide radiation energy light and heat waves. As we shall show that our computations in chapter 8, section 8.5 reveals that at the present rate of energy emission the sun loses mass of 6 X 10^{11} kg per second from thermonuclear burning of Hydrogen into Helium [17]. Naturally, this loss of mass and loss of energy should affect temperature of the sun. At least some section of the sun will experience decrease of temperature. Also, one needs to know at what minimum temperature the thermonuclear burning of Hydrogen into Helium will not occur. Because those sections of the sun that has temperature below that limit, their Hydrogen will not burn into Helium to produce high energy output. To predict the

life span of a main sequence star such as the sun it is imperative to estimate temperature variation inside the sun and relative concentration of Hydrogen gas from Sun's surface to the center. In the following, we shall first describe a method that provide very rough estimate of temperature at the center of the sun. Then we shall discuss technique that presents temperature profile for the sun's core with high accuracy.

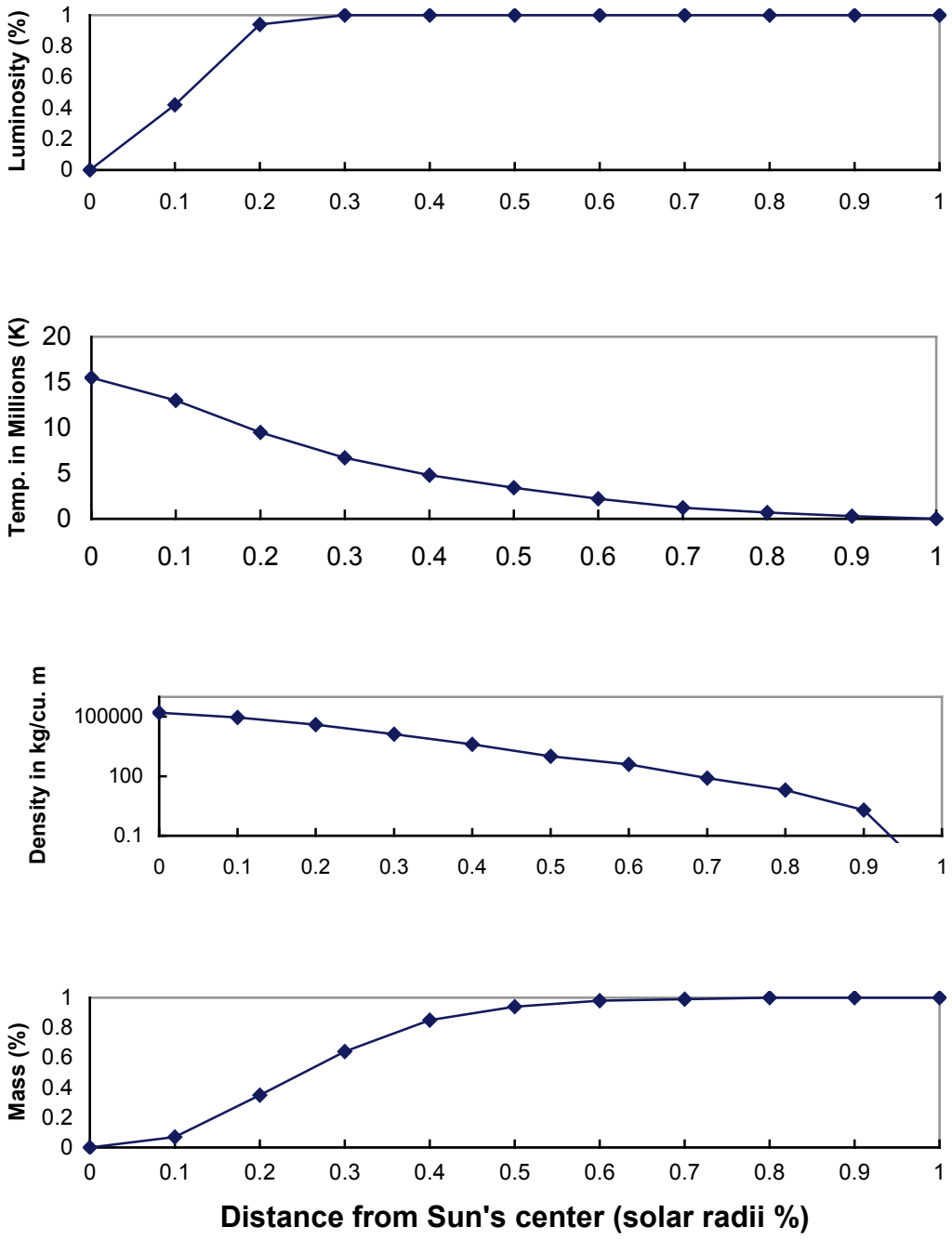

Figure 2.2 Theoretical model of the sun's interior. Parameters Luminosity, temperature, density and mass are plotted vs. distance from the Sun's center.

Table 2.6 A theoretical model for the Sun.

Distance from Center,% Radius	Brightness Fraction	Mass Fraction	Temp. X 10^6 K	Density Kg/m^3	Pressure Rel. to Center	Mean free path mm
0.0	0.0	0.0	15.5	160,000	1.00	0.243
0.1	0.42	0.07	13.0	90,000	0.46	0.443
9.2	0.94	0.35	9.5	40,000	0.15	0.992
0.3	1.0	0.64	6.7	13,000	0.04	2.624
0.4	1.0	0.85	4.8	4,000	0.007	10.742
0.5	1.0	0.94	3.4	3,000	0.001	53.261
0.6	1.0	0.98	2.2	1,000	0.0003	114.876
0.7	1.0	0.99	1.2	400	4 X 10-5	469.947
0.8	1.0	1.0	0.7	80	5 X 10-6	2193.086
0.9	1.0	1.0	0.3	20	3 X 10-7	15664.9
1.0	1.0	1.0	0.006	0.00003	4 X 10-13	23.498X10^6

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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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