Chapter 1

Introduction:
Beyond Spacetime

ABSTRACT

This chapter serves as an introduction to bring readers from spacetime relativity to YinYang bipolar relativity. Einstein’s assertions regarding physics, logic, and theoretical invention are reviewed and his hint of YinYang bipolar relativity is identified. The limitations of general relativity and quantum mechanics are briefly discussed. It is concluded that logically definable causality, axiomatization of physics, axiomatization of agent interaction, and the grand unification of general relativity and quantum theory are essentially the same problem at the fundamental level. A paradox on Hilbert’s Problem 6—Logical Axiomatization for Illogical Physics (LAFIP)—is introduced. Bipolarity is postulated as the most fundamental property of nature transcending spacetime. The theoretical basis of agents, causality and YinYang bipolar relativity is highlighted and distinguished from established theories. The main ideas of the book are outlined.

(Note: In this book we refer to relativity theories defined in spacetime geometry as spacetime relativity. Thus, all previous relativity theories by Galileo, Newton, Lorenz, and Einstein belong to spacetime relativity. This terminological treatment is for distinguishing YinYang bipolar geometry from spacetime.)

INTRODUCTION

Ever since Aristotelian science was established together with Aristotelian bivalent truth-based syllogistic (or classical) logic 2300 years ago, scientists have been devoting their lifetime efforts to the noble cause of seeking truths from the universe. Boolean logic (Boole, 1854) reinforced the truth-based tradition and

DOI: 10.4018/978-1-60960-525-4.ch001
Introduction

eventually led to modern digital computer technologies that, in turn, significantly extended the reach of scientific explorations by mankind into both macroscopic and microscopic agent worlds.

Scientific explorations, unfortunately, have not been able to escape the delicate balance of Mother Nature. In the microscopic agent world, the painstaking quest for quantum gravity—Einstein’s unfinished unification of general relativity and quantum mechanics—has so far failed to find a decisive battleground (Smolin, 2006; Woit, 2006); quantum entanglement remains a mystery (Penrose, 2005, p. 591) that is hindering the development of quantum computers; mental equilibrium and disorders are unexplained at the neurobiological and neurophysiologic levels; and, despite one insightful surprise after another that the genome has yielded to biologists, the primary goal of the Human Genome Project—to ferret out the genetic roots of common diseases like cancer and Alzheimer’s and then generate treatments—has been largely elusive (Wade, 2010). In the macroscopic agent world, “big bang” so far came from nowhere and was caused by nothing to our knowledge; economic recession has been a recurring problem; and global warming is threatening the very existence of human civilization including the scientific establishment itself.

Conceivably, truth is subjected to observability and limited to certain spacetime but equilibrium or non-equilibrium, as a central concept of thermodynamics—the ultimate physical source of existence, energy, life, and information, is ubiquitous and ruthless. Despite the proven incompleteness of truth-based reasoning (Gödel, 1930) and the mounting evidence for action-reaction forces, negative-positive electromagnetic charges, matter-antimatter particles, mental depression and mania, economic recession and expansion, genomic repression and activation, social competition and cooperation, global cooling and global warming, big bang and black holes, or Yin and Yang of nature in general that overwhelmingly suggest a bipolar equilibrium-based universe (including equilibrium and non-equilibrium states), few scientists have asked the difficult question: Whether the universe is actually truthful and whether the truth-based tradition is adequate for furthering scientific explorations?

A central theme of this book is that the universe is not truthful but bipolar. This theme leads to a paradox on Hilbert’s Problem 6—“Axiomatize all of Physics” (Hilbert, 1901). The paradox states: “Logical Axiomatization for Illogical Physics” (LAFIB or LAFIP) (Zhang, 2009a, 2009b, 2009c, 2009d). LAFIP manifests the inconvenient truth that truth-based logical reasoning is inadequate for axiomatizing the illogical aspects of physics. This monograph is, therefore, not for seeking truth from the universe but for resolving the LAFIP paradox in modern science. The resolution to be presented is YinYang bipolar relativity which is shown to be a deeper unifying logical foundation transcending spacetime and spacetime relativity including relativity theories by Galileo, Newton, Lorenz, and Einstein.

In front of the historical giants of science and philosophy, every living scientist or philosopher is entitled to feel humble and respectfully follow the established scientific tenet. No wonder the editor of an influential logic journal once posted a slogan on his website that read “Never Question the Logic of Aristotle.” Evidently, this editor became “too humble” to realize that at Aristotle’s time air and water were deemed the most fundamental elements and the Earth was believed the center of the universe; Copernicus would have not been able to discover the solar system had he not questioned Aristotle’s cosmology and Einstein would have not been able to develop his general theory of relativity had he not questioned Aristotle’s ether theory.

Despite his great contribution to science and philosophy, Aristotle’s logic as well as his philosophy was inevitably subjected to the scientific and technological limitations at his time. For instance, while Aristotle’s causality principle has been widely considered the doctrine of all sciences for more than two thousand years, the principle, however, is irreducible to regularity as asserted by 18th century Scottish...