

Excerpts from

# *Dynamic Tao and Its Manifestations*

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## PREFACE

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*All teachings have their principles, and  
all efforts have their guiding rules.  
Unless by Wu-wisdom<sup>1</sup>,  
there is no way to understand my principles.*

(From the Laotzu Chapter 70)

It is exciting to witness what is happening. The world is marching toward a wonderful spiritual and material unification. Tao philosophers do not have to walk alone. Our understanding of our universe is still developing, but we have enough evidence to be joyful.

It started with quantum mechanics and culminated with quantum cosmology. Within about 100 years, the physicists paved a smooth road for us to understand the ancient Tao philosophy.

### **Quantum Theory and Cosmology**

Einstein received a Nobel Prize for his work on photoelectric effects<sup>2</sup>, because he resolved a paradox by observing that light energy is absorbed by atoms in quantized amounts<sup>3</sup> and that a

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<sup>1</sup> Wu-wisdom is the ultimate wisdom corresponding to the Wu state of Tao. See Section 4.3.

<sup>2</sup> The photoelectric effect was discovered by Hertz in 1887. Einstein's theory referred to particles of light as "light-quanta."

<sup>3</sup> In 1900, Max Planck first postulated that light energy is quantized in small steps because there was a puzzle about heat radiation from a hot iron (black body). He is considered the inventor of quantum theory. Einstein's paper on the photoelectric effect was published in 1905.

light wave behaves like a particle with energy and momentum. Niels Bohr proposed quantized energy levels for electrons in an atom. In 1926, Schrödinger proposed a wave equation to describe the hydrogen atom and, one year later, Heisenberg proposed the Uncertainty Principle.

When electrons were shown to produce interference patterns like ripples of waves in diffraction experiments, we had to abandon the particle view as the only view of traditional physics.

*But, nothing in nature was changed. We changed and accepted the particle-wave duality.* We have accepted the particle-wave duality and the uncertainty principle as nature. In spite of its seemingly contradictory nature, quantum theory became the most successful theory for our microscopic world.<sup>1</sup>

In 1905, Einstein proposed his revolutionary Special Theory of Relativity. We soon abandoned the absolute nature of space and time. Mass and dimensions change with the speed of an object. This mystery replaced many other mysteries. His General Theory of Relativity in 1916 dealt with the gravitational space-time phenomena of the universe. The theory predicted the formation of a black hole, which was then observed.

We have tremendous success in microscopic and macroscopic scales. The physicists started to dream of a unified theory for everything. Quantum Cosmology<sup>2</sup> is such an attempt to unify the quantum theory with general relativity into a unified framework for all fundamental forces known to man. We now have a theory that covers everything from the fundamental particles to the universe.

### **The Ultimate Universe**

When we say that we have a unified theory in science, we are actually saying that our minds have been able to re-orient themselves in order to see nature in a unified fashion. Nature has not changed; our minds have changed.

What do we get when we understand the nature of everything? We get a mind that is in harmony with our universe. This is the ultimate universe, inside and outside. Physics describes what we observe outwardly; Tao describes how we observe inwardly. After black hole thermodynamics, superstring theory, loop quantum gravity, etc, Gerard 't Hooft,<sup>3</sup> in 1993, proposed the holographic principle to describe the physical universe which echoes so vividly the way Yo (or *You*) 有 interacts with Wu 無 in Tao philosophy.<sup>4</sup>

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<sup>1</sup> Niels Bohr was awarded the Nobel Prize in 1922. Werner Heisenberg won the Nobel Prize in 1932 for his creation of quantum mechanics. He also worked with Niels Bohr on the Copenhagen Interpretation. Erwin Schroedinger won the Nobel Prize in 1933 for his wave equation. Louis de Broglie won the Nobel Prize in Physics in 1929 for his discovery of the wave nature of electrons.

<sup>2</sup> Quantum Cosmology theorists include the scientists we quote in this book, Stephen Hawking, Peter Higgs, Lee Smolin, L. Susskind, and Gerard 't Hooft. Researches in quantum gravity, particle physics, string theory, black hole thermodynamics (entropy), and loop quantum mechanics lead to an ultimate picture of our universe.

<sup>3</sup> Gerard 't Hooft received the Noble Prize in 1999. The holographic principle is described in Section 7.

<sup>4</sup> After holograms were discovered in 1982 in Paris, many areas of research were impacted [see TA92]. It has changed our psychological, philosophical, and religious thinking. The holographic principle helps us interpret Tao philosophy.

Why do we talk about evolution of Physics? Because, in the last 100 years, we have found a way to reconcile our inner universe with our external universe. The story in Physics we are telling our next generation was told once 2500 years ago. In the Tao Te Ching, Laotzu<sup>1</sup> described a Tao philosophical system that today reminds us so greatly of quantum theory and the holographic effects.<sup>2</sup> Our understanding of Physics has evolved to a point where it can provide a consistent way to describe Tao philosophy.

### **Scientific Modeling**

We must learn from our physicists how they resolve paradoxes by changing how we think. In order to understand the Tao Te Ching, we have to change how we think. Much of our effort in this work has been to treat the words of Laotzu as the observed Truth and to find meaning in them by re-orienting the way we think.

We have created a scientific model to describe Tao philosophy. After the paradoxes are resolved, we are surprised to see a Tao universe that is consistent with physicists' views of the "physical" universe.

### **Tao Principles**

Our work started as a simple attempt to translate the Tao Te Ching into English. In order to have a systematic approach, we searched for the basic principles of Tao philosophy. We did not expect any connection with modern science.

By careful analysis, the mysteries of Tao revealed themselves, one at a time, and led us to an astonishing conclusion. Tao principles appeared naturally from the Tao Te Ching. We were willingly led by the words of Laotzu, with no intent to mystify or demystify Tao. At the end, we were totally surprised by the *scientific* approach taken by Laotzu.

### **Why Bother with Tao?**

Why is Tao important at all? Tao philosophy can provide a way for those who wish to maintain harmony in the world. Many people believe that Tao is essential in understanding the Chinese culture. If that is the case, it would be a disservice to think that it is mysterious and incomprehensible. It is not particularly useful to consider a culture as mystic. The world has become a global community and we should attempt to understand all cultures on the same footing as our own culture. It is, therefore, important to present Tao philosophy with its utmost authenticity and clarity, as a base for mutual understanding.

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<sup>1</sup> Laotzu was believed to be born in 571 BC, the year of the tiger, before Confucius. His surname might have been Lao, instead of Li, which was associated with him by early historians. Confucius twice sought advice from him [WA00]. These facts are subject to endless disputes. Fortunately, this is out of the scope of our interest. As references, we have Laotzu (b. 571 BC.), Confucius (551-479 BC), Socrates (469-399 BC), Plato (427-347 BC), and Aristotle (384-322 BC).

<sup>2</sup> This conclusion was not arrived at by coming from physics to Tao philosophy. We came across Smolin's book [SM01] while this manuscript was near completion. The Preface had to be re-written and a new section was added to discuss the wonderful connections.

### The Tao Te Ching

This ancient Chinese philosophy was consolidated by Laotzu 老子 as a book, the Tao Te Ching 道德經, around 500 BC. It is a small book with about 5300 Chinese characters, arranged in 81 Chapters. The verses seem terse, concise, and quite precise. Their suggestive nature has fostered a wide range of speculations and interpretations since the very beginning. Even Confucius expressed his awe about Laotzu.<sup>1</sup>

Chinese scholars debated over its interpretations. As a result, various Tao concepts have permeated into all Chinese philosophical thoughts and Tao became the root of many schools of Chinese philosophy. For unknown reasons, each school speculated on certain aspects of Tao and left other parts as mysteries. These mysteries became the source of fascination about Tao. The Tao Te Ching has since been regarded as a mysterious and self-contradictory philosophical text.

It has become almost impossible to give a fair treatment to Tao philosophy as a coherent philosophical system. The paradoxes are so well accepted that whoever professes a coherent Tao will invite criticisms. And yet, Laotzu firmly stated that his Tao follows certain principles. *Are there really any principles of Tao? What are they?*

Many have attempted to answer this, and many more will try. So far, there has been no sign of convergence in the interpretation of the Tao Te Ching.

#### Is it a language problem?

Most people have attributed the difficulty of interpretation and translation to the nature of the Chinese language. We, however, believe that the true difficulty resides in not understanding the nature of Tao. Even the Chinese scholars do not have a coherent interpretation of the original text.<sup>2</sup>

It becomes obvious in hindsight that language is not the main problem. We have been able to translate the most difficult concepts and theories in sciences from language to language without loss of accuracy. With a coherent Tao philosophy, translation should not be so difficult.

*A priori*, we have to assume that the Tao Te Ching text is systematic and Laotzu was a coherent philosopher. Both of these assumptions are not obvious, however, and we have to find our evidence in the original words of Laotzu.

In order to resolve the paradoxes and contradictions, we have to find a way to analyze them. In the process of this analysis, we may create and adjust a model of Tao in our minds, in order to accept what we read in the Tao Te Ching. In other words, we have to respect what we observe as Truth and adjust our minds (model) to it. This is similar to the way we solve scientific problems, we create a model or a frame of reference to represent what we observe.

Tao paradoxes exist because we are not synchronized with Tao.<sup>3</sup> We shall show that most of the paradoxes in Tao are the results of our failure to accept what Laotzu has said.

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<sup>1</sup> Confucius met Laotzu in 501 BC, when Laotzu was 70 year old.

<sup>2</sup> There are 266 known Chinese interpretations listed in [CH00]. There are also numerous translations. For recent English translations of the Tao Te Ching, see [AM03, HE89, WA58, LA92, and KO98].

<sup>3</sup> When we synchronize with Tao, we re-adjust our minds to synchronize.

### **Tao Keywords and Their Relationships**

To begin, we have to find a proper frame of reference so we can reconstruct a coherent Tao philosophy. A philosophy is a set of keywords and the networked relationships of these keywords. The translation methodology is to translate the complete set of keywords and to preserve the networked relationships.

Presumably, Laotzu has already defined a complete set of keywords and their relationships in the Tao Te Ching. Some keywords may be obvious, but others may be hidden. For example, Laotzu claimed that we should try to understand his Tao principles with “Wu-zhi 無知.”<sup>1</sup> What is this Wu-zhi? After properly decoding the verses, we recognize Wu-zhi 無知 as a keyword in the Tao Te Ching. As shown in our new interpretation, we have re-discovered Laotzu’s concept of Wu-zhi, which was never intended to mean “without wisdom,” or ignorance. Instead, it is the true wisdom associated with Wu.

This is an essential keyword that was not properly recognized before. Such a fundamental realization prompted a need to re-analyze all concepts of Laotzu. While we re-interpret or un-interpret the paradoxical verses, we can often recover clear messages of other keywords that have been hidden in the verses.

### **A Proper Conceptual Language**

After we have identified the keywords, we may search for a proper framework to discuss the relationships between the keywords. What is the proper conceptual language for Tao? During our analysis, concepts from modern physics often appear to re-orient our minds to understand Laotzu’s words.

We have seen many interesting similarities between Tao philosophy and quantum theory. In quantum field theory, the interaction potential is a result of energy exchange between the two interacting particles. The exchanged energy is quantized and may be represented as *virtual particles*. In our application, we can consider that man-heaven interactions are due to exchange of the Chi energy in the Tao field. We, therefore, find that quantum field theory could be a convenient conceptual language for Tao philosophy.

### **Laotzu as a Field Theorist**

Initially we hesitated to adopt quantum field theory for our discussion, since this is a rather unorthodox approach for Tao philosophy.

We later realized that Laotzu had already formulated his original Tao philosophy as a field theory! He describes the interactions between man and heaven in terms of Chi exchange. With the properties of Chi, his field model shared a common basis with other field theories, such as the quantum field theory.

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<sup>1</sup> Laotzu Chapter 70: Unless by Wu-wisdom, there is no way to understand my principles 夫唯無知也，是以不我知。 This verse has been very puzzling to many because of its Chinese syntax structure. It will remain as a puzzle why these two verses have been hidden from many interpretations. One factor may be that the keyword Wu-zhi 無知 has never been properly identified. The Chinese sentence structure now appears quite straightforward.

### Why Quantum Field Theory?

Although a few people might consider linking Laotzu's Tao theory to quantum field theory as being unjustified, our view is quite different. The fact that an ancient philosophy can be discussed together with the modern sciences is an important indication of their fundamental truth. We may never know why this is so; but, it would have been a psychological disaster if our spiritual universe were inconsistent with our concept for our physical universe.

We do have a more obvious reason why we can link Tao to quantum theory. For thousands of years, we have been influenced by *dualism*. Soon after Laotzu, Chinese philosophers took on dualistic views on Tao, as shown in their debates on the relationship of Yo 有<sup>1</sup> and Wu 無 (see Section 6). Even now, we often subconsciously assume dualism in our analysis and we are at a loss when a phenomenon cannot be reduced to dualistic logics. As discussed in Part I, we cannot represent Tao in a purely dualistic framework. Tao is non-dualistic and dualistic at the same time.

### Quantum Field Theory of Tao

In early 1900, the physicists were faced with similar puzzling paradoxes and developed quantum theory, as a non-dualistic conceptual language to describe our physical nature. Quantum theory is a coherent framework for discussion of non-dualistic phenomena, and could be a natural candidate for description of Tao philosophy. Physicists have already recognized some physical phenomena similar to Tao, as described by Capra [CA00].

In the course of this work, quantum field theory has helped us to re-orient our minds to establish a conceptual model for Tao philosophy. We stated our hypothesis for a Quantum Field Theory of Tao,<sup>2</sup> and then developed a Tao philosophy based on the words of Laotzu. We will use this as a new conceptual language to describe Tao philosophy.

We have also used the results of quantum cosmology to sort out the complicated relationships between Yo and Wu. It was a wonderful reassurance that Tao philosophy is conceptually complete and we can proceed to prepare for the translation.

### A Scientific Translation

After we have a coherent model of Tao, we can translate this Tao philosophy into English. As in any scientific translation, we want to preserve the Tao's coherency, by translating both the keywords and their networked relationships. Here we encounter a common problem in any translation - do we have a proper set of keywords in English?

Tao philosophy brings new concepts with it to the target language system. When the target language does not have a proper set of keywords to describe Tao, we have to define new words in the target language.<sup>3</sup> New terms are commonly introduced in sciences and mathematics, to

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<sup>1</sup> The standard Romanization for the character 有 is *You*, but we have chosen to use *Yo* in this work as a new term to describe an important aspect of Tao philosophy.

<sup>2</sup> We should attribute also the "Quantum" aspect of the theory to Laotzu, since Chi represents minute and imperceptible energies that are imbedded in all under heaven and are exchanged between man and heaven. The symmetry properties of Chi quanta are described by Laotzu as the interplay of yin and yang.

<sup>3</sup> For example, the best translation of the word Tao is simply Tao and, when we attempt to translate Wu 無 as emptiness or nothingness, we introduce unnecessary confusions. In introducing Chinese philosophy to the West,

avoid undesirable connotations. After we have selected a complete set of keywords, we can translate Tao concepts and their relationships as a complete model, from language to language.

By analogy to a scientific theory, our representation of Tao philosophy becomes language-independent.

### **Advantages of a Coherent Model**

An advantage of using a scientific model is that its internal consistency can be established among the keywords and their inter-relationships. When we make use of the quantum field theory to develop our description of Tao, we may assume that Chi exchange gives rise to interactions between man and heaven and the characteristics of these interactions will depend on the symmetry properties of Chi.

We may relate Wu and Yo (mathematically) to the Chi interactions and the bipolar symmetry of yin and yang. This relationship is well understood in quantum field theory and can only be detected in the Tao Te Ching verses with careful observation.

Furthermore, a theory used to correlate what Laotzu said in his Tao Te Ching can also be extrapolated to describe what Laotzu could have said in Tao philosophy. We have already recognized many subtle relationships in Tao that would have been much harder to do without the guidance of a model. Our model may guide us to speculate on other relationships that have not been explicitly articulated by Laotzu!

### **Laotzu has the Final Words**

It is, however, important to point out that the quantum theory is used only as a convenient conceptual language and our Tao philosophy depends only on the words of Laotzu.

### **Accident is Part of the Design**

Near the completion of our work, we discovered some interesting similarities between Tao philosophy and Quantum Cosmology. Tao and physics represent opposite ways of searching for the ultimate truth. It is wonderful to see that they come so close in their conclusions about our universe and our inner universe. Our current understanding of the universe brings new light to our analysis of Tao philosophy, especially the relationship between Wu and Yo.

Our effort has brought us much more than what we hoped to achieve in the beginning - our main purpose was to provide a true and honest translation of the Tao Te Ching. In doing so, we found it necessary to search for a model (to re-orient our minds) for a coherent Tao philosophy. We brought in quantum field theory as a convenient conceptual language, but the resulting revelations soon became a new and revolutionary paradigm for us to appreciate the true mysteries of Tao.

### **True Mysteries of Tao**

We have come to a fuller appreciation of the true mysteries of Tao. The objective of this work is not to remove, or to add, any mystery of Tao. The model clearly shows that we have recovered the true mysteries of Tao and the model will provide a foundation for a new direction

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we have already created many new words in English, such as Tao, Tai Chi, Yin, Yang, etc. In our model, we shall add to this list.

of Tao studies. We will have a guiding principle to speculate and extrapolate without going astray.

### **Great Work as yet Unfinished**

This work is clearly not exhaustive and will certainly be refined in further studies. This simple model and its underlying assumptions will certainly not be flawless. We hope that it can help our readers discover new directions for personal interpretations of Tao.

In our analysis, we have sought the Tao principles and the truth in Tao philosophy. We intentionally refrained from addressing historical interpretations of the Tao Te Ching, with exception of some clarifying views by other ancient Chinese philosophers. We have consulted a limited set of reference material so our citation is not inclusive. Various versions of the Tao Te Ching have led to the same Tao principles and dynamics.

We discuss our formulation of the model, *The Dynamic Tao*, in Part I – The Theory of Dynamic Tao.

### **Our Verse-by-Verse Translation**

For the Chinese text, we use the verses of the Mawangdui version as presented by Gao Min [GA96], with exceptions as noted. For historical interpretations by the Chinese scholars, we have consulted two recent Chinese references [CH00, GA96].

We have found that all chapters can be interpreted coherently, within the margin of errors in our interpretations of the ancient Chinese texts. No elaborate speculation is necessary to render a coherent interpretation of each chapter.

Our translation is kept straightforward and accurate in the light of our basic model. We have translated every verse in each chapter in Part II - The Verse-by-Verse Translation.

The original Chinese verses are listed side by side with their corresponding English translations.

### **Where do we go from here?**

This work provides a new paradigm for Tao philosophy, where we can see Tao philosophy in a systematic way. We have reached a new horizon where Tao not only does not mystify us, but can also guide us properly.

This might be the moment, as Laotzu proclaimed in Chapter 72, when the Greatest Tao can enter into our hearts:

民之不畏威，	<i>When people have no fear for Tao,</i>
則大威將至矣。	<i>the Greatest Tao can enter into their hearts.</i>

This marks the beginning of a modern era for Tao philosophy.