

## Foreword by Dr. Paul Meier

You may wonder why Yuri Nikolaievich Ivanov did entrust the honour of writing a preface to his Presentation to Rhythmodynamics to an outsider, a physician advocate of a holistic, systemic concept of life and universe. Should it not rather be the work of a physicist? The answer probably lies in the comparison made in this paper between the physicist interpreting the results of Michelson's instrument, and the little goldfish in its bowl which knows only his own environment, not knowing what is going on outside the boundaries of its container.

Indeed, it is only by a fundamental epistemological and comprehensive reflection about the conditions of observation and measurement of waves that Y. Ivanov managed to solve the problem raised by Michelson's experiment that was designed to measure the speed of the Earth in space, but whose results were negative and led to the interpretation of special relativity theory (SRT).

Critics of the SRT and proposals to rehabilitate ether are not lacking on internet. But critics do not solve problems. Few authors offer an explanation why the Michelson-Morley experiment failed to provide the results predicted by the calculations and the proposals raise new questions and new hypotheses.

Like Ivanov, other researchers have questioned the principles of modern physics, maintaining that "matter is made of waves", following the principles of wave mechanics of Louis de Broglie (Milo Wolff, Gabriel Lafrenière, Denys Lépinard). Each of them has brought important new ideas. However Ivanov's Rhythmodynamics deepens and formulates the most basic principles of movement, in both, physical and epistemological terms.

What distinguishes the relativity of Ivanov from that of Einstein is the questioning of a tacit consensus that experimentation is the final and absolute criterion of scientific truth. The principle of relativity of Einstein, that the laws are the same for all Galilean frames of reference, is due to this belief. It ignores the existence of an absolute frame of reference on which depend specific frames. SRT considers each particular observer as independent and the reciprocal observations of two observers depend only on the relative speed between them, regardless of their speed compared to a common or absolute environment. Could an aircraft be controlled and fly if its speed was measured only relative to a second plane and regardless of its speed relative to the air, the common medium which carries them?

The **principle of Ivanov** that corrects this error is the axiom of foundation according to which there exists necessarily a support for any geometric construction. This axiom gives space the status of a real ground for constructing wave geometry. It places at the same time geometry at the origin and center of any theory in physics. This principle is not an assumption but an evidence, an axiom. It is the return to common sense and ancient wisdom. It is said that the pediment of Plato's Academy in Athens bore the inscription:

**"Let no one ignorant of geometry enter"**

Even if this phrase is not from Plato but has been assigned to his Academy by the Neo-Platonists of Alexandria, ten centuries later, we must acknowledge that it expresses the ideas of the ancient Greek philosophers.

From this axiom of foundation result as corollaries Ivanov's three postulates: 1) oscillators as wave sources, 2) wave propagation in the medium at the constant speed  $c$ , and 3) wave interferences forming standing waves.

On the basis of geometry and wave dynamics, Ivanov discovered and explored the contraction of standing waves depending on the speed in the wave medium, a theoretical discovery which was confirmed later by series of mechanical and acoustic experiments which were even more ingenious as their realization is simple, basic and easily reproducible.

The behaviour of electromagnetic waves can not be different from that of mechanical and phonetic waves, since the latter, according to acousto-optical techniques, depend themselves on electromagnetic bonds between the atoms. Therefore, the size reduction of standing waves has the effect of body size reduction and since everything is proportional inside of the same system of waves and oscillators, this reduction is not measurable within the system.

This conclusion reverses the roles of the observer and the observed reality relative to speed: it is not the frame of reference of the observer which remains constant and space-time which deforms as in the SRT; on contrary the observer and his instruments deform and contract relative to the stationary space and constant time. In other words, it is not the man who determines space and time; on contrary time and space shape the size of man.

This behavior is due to a compensation of phase shifts, already proposed by Louis de Broglie under the term "harmony of phases." By the same process, Ivanov also explains movement, acceleration, gravity, inertia force and the self-organization which shapes structures and forms of matter. All this is clearly explained and formulated by Rhythmodynamics and requires only basic knowledge of geometry and algebra.

Geometry and wave dynamics open the ways to explanations of other properties hitherto regarded as "inherent in matter" such as mass, charge, electricity and magnetism. It should however be noted that Rhythmodynamics does not deny the achievements of quantum and relativistic physics. It considers them in a common, more general and universal framework. However some dogmatic beliefs, which have become real idols, are relativized.

The first of these is the "matter", fetish of Western materialistic civilization. The statement that "the universe is made of matter" implies that it is governed by a gravitational force proportional to mass, a postulated force whose nature whose very nature has no physical explanation, only a formalization in general relativity (GRT) by the mathematical trick of curvature of space-time. The matter however exists as structure of the universe, at least at the macroscopic level. But the mass is a measure of inertia and Ivanov says it is not an elementary property of oscillators and waves but appears only with systems of oscillators forming structures.

It should also be understood that for Rhythmodynamics, ether is not material. When Ivanov speaks of the ether as a carrier or proto-matter, he means it as a substance in the sense of the Latin etymology and classical Aristotelian philosophy, as a permanent unmanifest medium underlying impermanent perceptible phenomena called accidents.

A second idol is the already mentioned belief in the absolute value of observation and experimentation. There are relationships and processes that can not be detected by the

experimental observation but whose evidence appears by their consequences and predictability. Scientific knowledge is induced by observation but mainly results from reasoning. The experiment is usually designed and built in order to prove a previously established theory and does not lead to a breakthrough, to new theories, except when its purpose fails, as Michelson's mishap teaches us. The result of an experiment can be deceptive when it is reconsidered in a more universal or absolute frame of reference. The result of the experiment should be evaluated taking into account its level in the systemic hierarchy of reality that extends from the quantum of Planck to the knowable universe of Hubble.

The systemic levels should not be confused with the stepwise advances of science postulated by the evolutionary epistemology of Karl Popper, which is based on another belief: that of a continuous progress of science. Science does not always progress continuously towards progress; it knows stationary periods and even degeneration. For a new start, the contemporary physics needs to abandon certain dogmatic beliefs; It must remember previous concepts, neglected discoveries of forgotten authors of the 19th century and even return to traditional comprehensions of space and time, restoring the ether according to the concepts "before 1905".

With its three postulates the axiomatic of Rhythmodynamics reminds by analogy metaphysical trilogies, which are the foundations of realistic cosmologies underlying the medical practices of China (yin, yang and qi of Taoism) and India (the three Gunas of Samkhya-Yoga). We can understand them with the classical Aristotelian causalities: The ether is the *material cause*, the principle of Being. The wave motion is the *efficient cause* or principle of Transformation. Finally, interference of waves are the *formal cause*, the principle of creative Construction by self-organization, whose human form is the final cause.

René Descartes wrote:

The philosophy is like a tree, whose roots are the *metaphysics*, its trunk the *physics*, and the branches the rest of sciences, mainly *medicine*, *mechanics*, and *morals* that is the last level of wisdom.

Writing "cogito ergo sum", "I think therefore I am," this philosopher and scientist between Renaissance and Enlightenment, knowing the Neoplatonism, did not mean a separation between material things and spiritual things but their complementarity.

Physics and metaphysics always influenced each other. Empiricism and Newtonian mechanics were at the origin of positivism and scientific materialism. By reaction to materialistic rationalism, relativity is nowadays used as pretext for close relativistic esotericisms leading to solipsism or agnosticism.

Welcome therefore to Rhythmodynamics, It promises scientific breakthroughs in physics and new technologies for more economic and non-polluting use of energy. But it also announces a new understanding of the universe, a new rationalism based on complementarities, close to the sane common sense of Descartes, able to solve the vain disputes about absolute truths. It could open a new paradigm based on universal principles similar to those of ancient wisdom and of their cosmologies remaining near Nature and Life.