

## Processes in Experiences with Uncertainty: How to Approach?

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### Abstract

Design of the paper is on the line of combining different knowledge in one space and separating the communicative aspects. The goal of the article is to present a multilevel spacetime model to combine uncertainties to the form of information that gives new possibilities for social interaction and personal growth and development. The study *limited* itself with studies in three fields-mathematics (AI, number enneagram structures), sociology and world development (interactions visualized with graphs). *Application* to practice: Results of the article to be applied to development of theories and experiments in cognition and artificial intelligence, and to mainstreams of physics. Originality and significance. In approach to wicked problem solving the mechanism of reduction of knowledge of different subjects to a convergent modeling series has been found. Based on the four principal equivalencies (mass, space, time, energy) a forty-five multilevel spacetime model, FFSTM, opens ways to explore matter universe in 45 cyclic time units and their clusters.

**Keywords:** Multilevel spacetime model; FFSTM; Territory administration unit with special status; Wicked problem; Nanocluster; Physical law equivalencies; Technological platform

### Introduction

Crane and Pauzaskie present a roadmap for the development of large-scale nanowire processing. While myriad techniques exist for bench-scale nanowire synthesis, these growth strategies typically fall within two major categories: 1) anisotropically-catalyzed growth and 2) confined, template-based growth. However, comparisons between growth methods with different mass transport pathways have led to confusion in interpreting observations [1]. They review mass transport in nanowire synthesis techniques to unify growth models and to allow for direct comparison of observations across different methods [2]. They stressed on the growth and nanomanufacturing of one-dimensional nanowires in high volumes has the potential to enable applications of nanoscale materials in a diverse range of fields including energy conversion and storage, catalysis, sensing, medicine, and information technology.

Galileo called mathematics the “language with which God wrote the universe.” He described a picture-language, and now that language has a new dimension. Coecke B, Kissinger A present diagrammatic reasoning for description by picturing of the quantum processes [3]. Yaffe, Liu and Wozniakowski develop a 3d picture-language for mathematics with potential as a tool across a range of topics, from pure math to physics. They present a 3d topological picture-language for quantum information [4]. Their approach combines charged excitations carried by strings, with topological properties that arise from embedding the strings in the interior of a 3d manifold with boundary. A quon is a composite that acts as a particle. The authors of this paper interpret multiquons and their transformations in a natural way, and obtain a type of relation, a string-genus “joint relation,” involving both a string and the 3d manifold<sup>1</sup>. The real time, *in situ* observation of the photocatalytic destruction of *Saccharomyces cerevisiae* (*S.cerevisiae*), an essential eukaryotic unicellular model of living cells, was conducted by the authors of the paper with this new observation technique, which demonstrated clearly that the photocatalytic destruction effect was much stronger than the photodamage effect caused by the visible light irradiation alone in the disinfection process [5].

<sup>1</sup>“It’s a big deal,” said Jacob Biamonte of the Quantum Complexity Science Initiative [4]

We move along this line of producing visual language for description timespace as particles with quantum properties [6-11]. The goal of the article is to present a multilevel spacetime model to combine uncertainties to the form of information that gives new possibilities for social interaction and personal growth and development.

## To New Physical World View. Wicked Problems and Problematic State

If the circumstance we have found, linked with chaos, put in comparison with other circumstances of experimental work, we inevitable come to that we have deal with wicked problem. Horst Rittel and Melvin Webber stated the following features of the problematic state: there is no its strict definition; there are no norms and rules prescribing how to approach it; solutions are not determine with criterion true-false, it is allowed criterion good or bad; there is no direct and final test the solution; every solution of wicked problem is unique (one shot operation) and achieved with the probe and mistake method; it has no counted set or exhaustive description of potential results as well as well described and acceptable actions to include them into plan; every such a problem is unique, it may considered as a symptom of another problem<sup>2</sup>; the existence of difference that presents a problem may have different explanations; choice of explanation defines a nature of problem solving, and - the last - it is not allow to attitude to planner as to person who acts not in true way [12].

Worldview is an image in producing of which instead of colors principles and approaches used. A worldview consists of fundamental constant part and the fragments by use of which we may build discourse about changes and futures. Recent approaches to the futures studies, in particular in USA, were based on par excellence empirical methods of classical physics of Newton with is mechanistic and therefore predictive regard to the human nature, Jennifer M Gidley writes. – Science at relevant degree has moved from close system, predictive and mechanistic world picture to one of quantum, organic and open, and comes close to the worlds of chaos, complexity and self-adaptive organization. Identity of research domain in futures studies may not limit itself with 'prediction of the future' only. J. Gidley defines five traditions of the futures studies; each of them has different philosophical backgrounds [13,14]:

- (1) Predictive tradition developed in USA and focuses on trend analysis and empirically based analysis
- (2) Critical tradition, develops in Europe as a critic to American empirical predictive approach
- (3) Cultural tradition that appears from the work of those who suggested to include non-western cultures as part of the civilized futures
- (4) Participatory research approach used in Europe and some researchers in Australia from 1990s and
- (5) Integral or trans-disciplinary and open approach to the futures studies with attempts of inclusion multiperspectivity and planethood.

These traditions may use in definite context in part or as a whole in the futures studies domain.

## Concept of the Matter and Its Development. Spacetime

V.Tsivin writes that the sense of matter is not in movement but in interaction as a more developed form of physical movement [15]. The Newton Dynamics Law,  $F=ma$ , stresses in relevance of mass. Geometric dots with masses interacts each other with some forces. He develops physical logic that differs from mathematical one. The main feature of such logic is the focus on method and approach to discover the truth. It is uncertain truth, but on the way we stay in our knowledge closer to it. Classical mechanistic physical concept of the matter (material and field) elaborated by Galileo and Newton, is in bonds with the concept of the form (space and time) and the concept of the force (cause and act). This concept defines approach to study physical phenomena. Relativistic views (electrodynamics and thermodynamics) and quantum mechanics made transformation of this concept. It gets new possibilities for its development. Concept of the body has been modernized. New pictures of interaction of bodies and fields appear. The quest goes to different level; nevertheless the simple models are still valid. A Newtonian conceptual transition from the set of space, time, movement to the set *mass, space, time* has continuation in the transition to *mass, space, time and energy*, which A. Einstein realizes. From equivalence of space and time,  $s=ct$ , follows equivalence of energy and mass,  $E=mc^2$ , and equivalence of space and energy,  $E=sc$ , equivalence of mass and time,  $mc^2=tc$ ; and equivalence of kinematics and dynamics.

Time and space becomes dynamical values, interact each other like mass and energy.

New horizons for physical studies follows from the conclusions that space is mass of mass,  $mm$ , time is a space of space,  $ss$ , and energy is time of time,  $tt$ ; where  $v=s/t=st/E=mmt/E$ ,  $a=s/tt=s/E=mm/E=mm/tt$ . Transition to the set *mass, space, time, energy and impulse* comes; and statement that (if  $d=const$ ) impulse is energy of energy take to oi regard. The concept of the matter replaces by the concept of complex known energies governed by space. W Ostwald develops some concepts but they become abstract ones because their unilateral statements, energy of movement is kinetic, energy of distance is potential, and energy of form is phase state of material. Here it is a point of start for new quest, for configuring different knowledge.

## Methodology

### Time Markers

If we have many sheets of paper we may do conventional act of distinction the past from the future and the present; we write 'the

<sup>2</sup>Cf. For practical pedagogy the common place is the statement that formation of the first group of abilities and competences mean the formation of the other group; the last ones are necessary prerequisites for the first group [13]

future' on one, and 'the past' on other. On the 'future' sheet we write task to them as requirement to execute it in the future. This and only this is the future we have. It means that we alive; when we stop goal putting then we are dead. Goals also need in their markers: past, present, and future. Nothing takes place, but the past is as well as the future. The goal for execution by other is a will of writer also is a goal. A set of time free, not references to time, goals allowed to write at the sheet 'general, desired'; they writes like goals. And we may write 'Goal to the nearest works' and we 'call upon these somebody to do'. It means change of psychic intention; it appears in change of local names.

**Application of FFSTM to the Nanocluster**

Life on the Earth aroused 13, 77±0,059 billion years ago. Bacteria have evolved since the origin to now a day. Human world is small and inexperienced enough. We search for new ways to live in peace with bacteria. And it gives us chance to live further. But how use this kind of knowledge? In logarithmic scale a picture of the universe has been visualized. Forty-five time cyclic units are grouped in series where some rules are set up. They are a second, a day, and a year centered ones. Algorithm of transformation one time unit to another, of the adjacent level, is discussed in the article we are working on. Some disciplinary applications of this model get their explanation. Figure 1 shows 45 particles, the lifetime of which, in seconds, is defined with formula  $9^n$ . On the field of short times, around  $n=17$ , particles of Nano size embedded.  $S= 917*c = 917*3*1010 = 1,78 \text{ nm}$ .

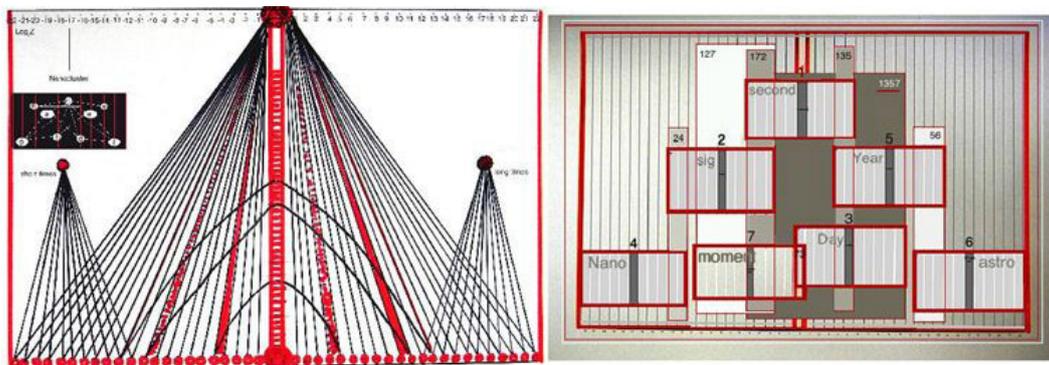


Figure 1: Forty-five spacetime model, FFSTM

Nanocluster consists of 9-11 'particles'. Their properties defines with experiments we are working on. Table 1 gives values of time and space of them. We use also parameter frequency. The long -times field related to astrophysics. We assume that between these clusters the coordinated bond exists.

Level, $n=\log_9 Z$	$9^n$ , sec	S of Light, sm	Comment
-22	1,01546E-21	3,04639E-09	
-21	9,13918E-21	2,74175E-08	
-20	8,22526E-20	2,46758E-07	
-19	7,40274E-19	2,22082E-06	
-18	6,66246E-18	1,99874E-05	
-17	5,99622E-17	0,000179887	
-16	5,3966E-16	0,001618979	
-15	4,85694E-15	0,014570807	
-14	4,37124E-14	0,131137265	
-13	3,93412E-13	1,180235387	
-12	3,54071E-12	10,62211848	

Table 1: Numbers of temporal cyclic level

**Consequences of the Event. Language for Description and Prescription**

The Present is on the ontology plane and on the planes of the affairs organization; consequences are on the conscience table of individuals, which take part on the event. Six-plane organization chart presenter on the Figure 2.

Consequences of any event have personalized accents. This allows to solve problem of interaction of two systems, such as (1) interaction of embryo and mother organism (this is a content of the structure of medical researches and technologies, see also paper [5]; and (2) innovations in organizations. Elaboration of the theme 'Acts of thinking affairs and the processes of system thinking development' means that new tools for this should be designed in frame of the division of methodology and theory of system analysis Figure 3 [16].

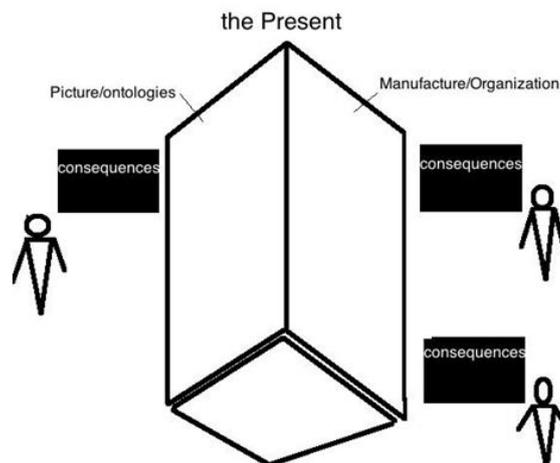


Figure 2: Six-plane Organization chart [13]

Our proposal presented on the Figure 3

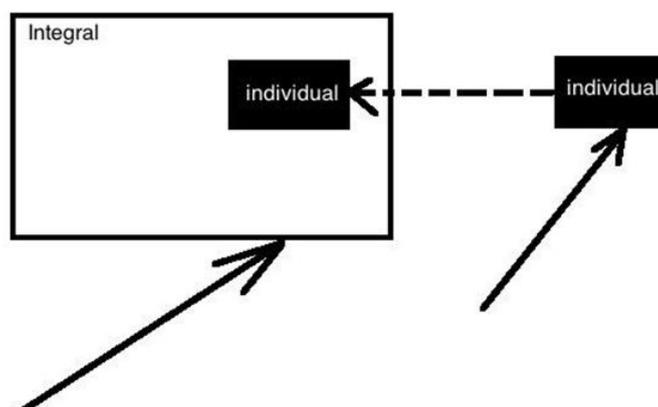


Figure 3: System Analysis [16]

Development of the System 1 (black rectangle on the Figure 3) goes on, intrinsic subsystem changed medium for its living. Now they, individual and integral, presented on ideal space. We introduce mutual time frame, the logical rather the real one; a complex combination of the different appears. Then the very complicated latent logical homogenization takes place due to the technical procedures. Arrows are for the development lines for individual and configure systems. Arrow from right-to-left is for technical act that produces new (re)organization and focuses on the integral system [8,16]. For instance, if we define individual system as previous status of complex region (Permskaya oblast plus Komi-Permyak Autonomous okrug) in old frame of federal relations (Russian Federation), the new individual (that changes medium of its living) is Perm krai in frame of new federal relations (Russian Federation with its constitution edited).

## Conclusion

Combination of different knowledge in one space and separating the communicative aspects lead to the better understanding the nature of the matter world. We presented a multilevel spacetime model to combine uncertainties to the form of information that gives new possibilities for social interaction and personal growth and development. Three fields we focused on are mathematics (AI, number enneagram structures), sociology and world development (interactions visualized with graphs). Results could be applied to development of theories and experiments in cognition and artificial intelligence, and to mainstreams of physics. Based on the four principal equivalencies (mass, space, time, energy) a forty-five multilevel spacetime model, FFSTM, opens ways to explore matter universe in 45 cyclic time units and their clusters.

## Highlights

1. Based on the four principal equivalencies (mass, space, time, energy) multilevel spacetime model opens way to explore matter universe in 45 cyclic time units and their clusters
2. We move along this line of producing visual language for description spacetime as particles with quantum properties
3. Figure 1 shows 45 particles, the lifetime of which, in seconds, is defined with formula  $9^n$ . On the field of short times, around  $n=17$ , particles of Nano size embedded.  $S= 917*c = 917*3*1010 = 1,78 \text{ nm}$

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