Intellectual Archive

BULLETIN

May
2012

ISSN 1929-1329

Intellectual Archive

BULLETIN

Abstracts and the descriptions of works in
Art and Science
submitted to www.IntellectualArchive.com

Toronto
May 2012

Publisher: Shiny World Corp.

Address: 9350 Yonge Street
P.O.Box 61533,
Richmond Hill, Ontario
L4C 3N0
Canada

E-mail: support@IntellectualArchive.com
Web Site: www.IntellectualArchive.com

Series: Bulletin

Frequency: Monthly

Month: May of 2012

ISSN: 1929-1329

Abstracts and the descriptions of works in Art and Science submitted to www.IntellectualArchive.com in May 2012

(this issue also includes the abstracts of four works missed in the April 2012 issue)

ID #: 256 **Natural Sciences / Astronomy / Cosmology**

Submitted on: Apr 03, 2012

Author: Mihai Gheorghe

Title: **The Bases of the Unifying Theory of Physics**

Abstract: In this book, a new theory is developed which has as a starting point the Planck quantum of mass-space-time and can answer the five big unsolved problems of modern physics: the unification of general relativity with quantum mechanics; deterministic formulation of fundaments of quantum mechanics; the description of different particles and forces in physics using one single theory; the elimination of adjustable variables in physics of elementary ; the nature of the phenomena known as the dark energy.

Web link: ***www.IntellectualArchive.com/getfile.php?file=L3m6H6slKgm&orig_file=Mihai_Gheorghe_The Bases_of_the_Unifying_Theory.pdf***

ID #: 273 **Natural Sciences / Astronomy / Cosmology**

Submitted on: Apr 11, 2012

Author: Fa-bo Feng

Title: **Radio Jets and Galaxies as Cosmic String Probes**

Abstract: The lensing effect of a cosmic string is studied, and some new methods are proposed to detect the cosmic string. We use the "alignment-breaking parameter" eta_G as a sensitive indicator of gravitational distortion by a wiggly cosmic string. Then, we applied the non-constant deflection angle to jets, and eta_G of a specific jet is just related to the projected slope of the jet. In the direction of the string, we find that galaxies appear to be rounder for an observer and the distribution of apparent ellipticity changes correspondingly. The future survey, such as Large Synoptic Survey Telescope (LSST) and Dark Energy Survey (DES), would weaken the requirement of special geometry in the data processing. As a result, all kinds of distributions, including ellipticity axis distribution, would serve as probes to detect wiggly strings in the near future. In brief, if a wiggly cosmic string existed, these signals would be convenient to be observed with the future weak lensing survey or other surveys in deep space. If there was no lensing signal in these distributions, it would give the upper limit of the abundance of infinite strings.

Web link: ***www.IntellectualArchive.com/getfile.php?file=CljuewYHLIv&orig_file=Fa_bo_Feng_Radio_Jets_and_Galaxies.pdf***

ID #: 274 **Natural Sciences / Astronomy / Cosmology**

Submitted on: Apr 11, 2012

Author: A.K.Balamuruhan

Title: **The Theory of Existences**

Abstract: I introduce some new concepts on the perception of physical existences, based on new interpretations of quantum mechanical wave functions. These new concepts remove the imbalance that we earlier had with regard to the physical existences. A new understanding about Gravity is presented. This understanding explains why gravity does not have a force-carrying particle. These concepts also lead to decipher the cosmological concepts, dark matter and dark energy. Further, It is found that time can exist even before the big bang.

Web link: ***www.IntellectualArchive.com/getfile.php?file=w4WUknu77ZT&orig_file=Balamuruhan_The_theory_of_Existences.pdf***

ID #: 282 **Natural Sciences / Astronomy / Cosmology**

Submitted on: Apr 13, 2012

Author: M. A. Ahmed

Title: **On f(R) theories in two-dimensional spacetime**

Abstract: In recent years, theories in which the Einstien-Hilbert lagrangian is replaced by a function f(R) of the Ricci Scalar have been extensively studied in four-dimensional spacetime. In this work we carry out an analysis of such theories in two-dimensional spacetime with focus on cosmological implications. Solutions to the cosmological field equations are obtained and their properties are analysed. Inflationary solutions are also obtained and discussed. Quantization is then carried out, the Wheeler-DeWitt equation is set up and its exact solutions obtained.

Web link: ***www.IntellectualArchive.com/getfile.php?file=rt47bq3dx8i&orig_file=M_A_Ahmed_On_f_R_theories.pdf***

ID #: 315 **Natural Sciences** / **Mathematics** / **Geometry**

Submitted on: May 02, 2012

Author: Yuri Burda

Title: **Around rational functions invertible in radicals**

Abstract: A class of rational functions characterized by some wonderful properties is studied. The properties that identify this class include simple algebra (their inverses can be expressed in radicals), simple topology (the total space of the minimal Galois covering dominating them has genus 0 or 1) and simple local topol- ogy (branching data). Explicit formulae for these functions are obtained as well as their classification up to different equivalence relations.

Web link: ***www.IntellectualArchive.com/getfile.php?file=1KGwNNgndKh&orig_file=Yuri_Burda__Rational_functions_invertible_in_radicals.pdf***

ID #: 316 **Natural Sciences** / **Mathematics** / **Calculus** / **Analysis**

Submitted on: May 03, 2012

Author: Jan Moser

Title: **Jacob`s ladders and the asymptotic equivalence of some integrals**

Abstract: In this paper we continue the study of a new class of integrals
containing the products of the factors $|\zeta|^2$. Namely, we obtain asymptotic formulae for some class of integrals containing a product
of polynomial in the variable $\vp_1^{n+1}(t)$ and the factors of type $|\zeta|^2$.

Web link: ***www.IntellectualArchive.com/getfile.php?file=Nn4adoKTvL8&orig_file=JL27.tex***

ID #: 317 **Natural Sciences** / **Physics** / **Mechanics**

Submitted on: May 03, 2012

Author: Alejandro A. Torassa

Title: **Classical Mechanics (General Definitions)**

Abstract: This paper presents general definitions in classical mechanics.

Web link: ***www.IntellectualArchive.com/getfile.php?file=KLipRf5du0h&orig_file=article9.pdf***

ID #: 318 **Natural Sciences** / **Physics** / **Mechanics**

Submitted on: May 03, 2012

Author: Alejandro A. Torassa

Title: **Classical Mechanics (Particles and Biparticles)**

Abstract: This paper considers the existence of biparticles and presents a general equation of motion, which can be applied in any non-rotating reference frame (inertial or non-inertial) without the necessity of introducing fictitious forces.

Web link: ***www.IntellectualArchive.com/getfile.php?file=hgTrAeYBiim&orig_file=article3.pdf***

ID #: 319 **Natural Sciences** / **Physics** / **Mechanics**

Submitted on: May 03, 2012

Author: Alejandro A. Torassa

Title: **On Classical Mechanics**

Abstract: A new dynamics which establishes the existence of a new universal force of interaction, called kinetic force.

Web link: ***www.IntellectualArchive.com/getfile.php?file=EST3AN7aQa0&orig_file=paper1.pdf***

ID #: 320 **Natural Sciences** / **Computer Sciences** / **Analysis of algorithms**

Submitted on: May 03, 2012

Author: Christian Lavault

Title: **A note on Prufer-like coding and counting forests of uniform hypertrees**

Abstract: This note presents an encoding and a decoding algorithms for a forest of (labelled) rooted uniform hypertrees and hypercycles in linear time, by using as few as n-2 integers in the range [1,n]. It is a simple extension of the classical Prufer code for (labelled) rooted trees to an encoding for forests of (labelled) rooted uniform hypertrees and hypercycles, which allows to count them up according to their number of vertices, hyperedges and hypertrees. In passing, we also find Cayley`s formula for the number of (labelled) rooted trees as well as its generalisation to the number of hypercycles found by Selivanov in the early 70`s.

Web link: ***www.IntellectualArchive.com/getfile.php?file=uSlaNifeAON&orig_file=Christian_Lavault__Prufer-like_coding.pdf***

ID #: 321 **Natural Sciences** / **Physics** / **Relativity**

Submitted on: May 03, 2012

Author: T.C. Choy

Title: **On the c equivalence principle and its relation to the weak equivalence principle of general relativity**

Abstract: We clarify the status of the c equivalence principle (c_u=c) recently proposed by Heras et al and show that its proposal leads to an extension of the current framework of classical relativistic electrodynamics (CRE). This is because in the MLT (mass, length and time) system of units, CRE theory can contain only one fundamental constant of nature and special relativity dictates that this must be c, the standard speed of light in vacuum, a point not sufficiently emphasized in most textbooks with the exception of a few such as Panofsky and Phillips. The c equivalence principle Heras can be shown to be linked to the second postulate of special relativity which extends the constancy of the unique velocity of light to all of physics (especially to mechanics) other than electromagnetism. An interesting corollary is that both the weak equivalence principle of general relativity and the c equivalence principle are in fact one and the same, which we demonstrate within the context of Newtonian gravity.

Web link: ***www.IntellectualArchive.com/getfile.php?file=wPGfXcnOLxp&orig_file=T_C_Choy__On_the_c_equivalence_principle.pdf***

ID #: 322 **Natural Sciences** / **Computer Sciences** / **Object-oriented programming**

Submitted on: May 03, 2012

Author: Yuriy Ostapov

Title: **Question Answering in a Natural Language Understanding System Based on Object-Oriented Semantics**

Abstract: Algorithms of question answering in a computer system oriented on input and logical processing of text information are presented. A knowledge domain under consideration is social behavior of a person. A database of the system includes an internal representation of natural language sentences and supplemental information. The answer Yes or No is formed for a general question. A special question containing an interrogative word or group of interrogative words permits to find a subject, object, place, time, cause, purpose and way of action or event. Answer generation is based on identification algorithms of persons, organizations, machines, things, places, and times. Proposed algorithms of question answering can be realized in information systems closely connected with text

processing (criminology, operation of business, medicine, document systems).

Web link: ***www.IntellectualArchive.com/getfile.php?file=EiLbMHijphA&orig_file=Yuriy_Ostapov__Question_Answering_in_a_Natural_Language.pdf***

ID #: 323 **Natural Sciences / Physics / Nuclear physics**

Submitted on: May 03, 2012

Author: M.V. Bondarenco

Title: **Account of Nuclear Scattering at Volume Reflection**

Abstract: For a particle traversing a bent crystal in the regime of volume reflection we evaluate the probability of interaction with atomic nuclei. Regardless of the continuous potential shape, this probability is found to differ from the corresponding value in an amorphous target by an amount proportional to the crystal bending radius, and the particle deflection angle. Based on this result, we evaluate the rate of inelastic nuclear interactions, and the final beam angular dispersion due to multiple Coulomb scattering. The theoretical predictions are compared with the experiments. The impact of multiple Coulomb scattering on the mean volume reflection angle is also discussed.

Web link: ***www.IntellectualArchive.com/getfile.php?file=ZqMOvnOMovJ&orig_file=M_V_Bondarenco__Account_of_Nuclear_Scattering.pdf***

ID #: 324 **Natural Sciences / Mathematics / Probability**

Submitted on: May 05, 2012

Author: Walter Schneider

Title: **Explicit Bounds for the Distribution Function of the Sum of Dependent Normally Distributed Random Variables**

Abstract: In this paper an analytic expression is given for the bounds of the distribution function of the sum of dependent normally distributed random variables. Using the theory of copulas and the important Frechet bounds the dependence structure is not restricted to any specific type. Numerical illustrations are provided to assess the quality of the derived bounds.

Web link: ***www.IntellectualArchive.com/getfile.php?file=O3NCFLUJRJr&orig_file=Walter_Schneider__Distribution_Function_of_the_Sum.pdf***

ID #: 325 **Natural Sciences / Mathematics / Statistics**

Submitted on: May 05, 2012

Author: Andrey Sarantsev

Title: **Statistical Investigation of Increments of Currency Rates Logarithms**

Abstract: We consider the currency rates dynamics for 12 currencies, including dollar and euro, with respect to Russian rouble. We prove that the Samuelson model (geometric Brownian motion) is not suitable for this dynamics. We also prove that another model (with inverse Gaussian increments of logarithms) is not appropriate for this situation. We point out the difference in behavior of different currencies, and the difference in behavior before and during the financial crisis which began in 2008.

Web link: ***www.IntellectualArchive.com/getfile.php?file=NiNJFgxn3jO&orig_file=Andrey_Sarantsev__Increments_of_Currency_Rates_Logarithms.pdf***

ID #: 326 **Natural Sciences / Mathematics / Combinatorics**

Submitted on: May 05, 2012

Author: Andrey Sarantsev

Title: **On a Generalization of Bernoulli and Euler Numbers**

Abstract: We introduce a series of numbers which serve as a generalization of Bernoulli, Euler numbers and binomial coefficients. Their properties are applied to solve a probability problem and suggest a statistical test for independence and identical distribution of random variables.

Web link: ***www.IntellectualArchive.com/getfile.php?file=IWrZdGoU7YI&orig_file=Andrey_Sarantsev__Bernoulli_and_Euler_Numbers.pdf***

ID #: 327 **Natural Sciences / Mathematics / Probability**

Submitted on: May 05, 2012

Author: Andrey Sarantsev

Title: **Tail Asymptotic of Sum and Product of Random Variables with Applications in the Theory of Extremes of Conditionally Gaussian Processes**

Abstract: We consider two independent random variables with the given tail asymptotic (e.g. power or exponential). We find tail asymptotic for their sum and product. This is done by some cumbersome but purely technical computations and requires the use of the Laplace method for asymptotic of integrals. We also recall the results for asymptotic of a self-similar locally stationary centered Gaussian process plus a deterministic drift; and we find the asymptotic for the same probability after multiplying the drift by a random variable, which is independent of this process.

Web link: ***www.IntellectualArchive.com/getfile.php?file=Mjglb0v5HmN&orig_file=Andrey_Sarantsev__Tail_Asymptotic_of_Sum.pdf***

ID #: 328 **Natural Sciences** / **Physics** / **Mathematical Physics**

Submitted on: May 06, 2012

Author: V. D. Efros

Title: **Method to solve integral equations of the first kind with an approximate input**

Abstract: Techniques are given for solving integral equations of the first kind with an input known not precisely. The requirement that the solution sought for includes a given number of maxima and minima is imposed. It is shown that
when the deviation of the approximate input from the true one is sufficiently small and some additional conditions are fulfilled the method leads to an approximate solution that is necessarily close to the true solution.
No regularization is required in the present approach. Requirements on features of the solution at integration limits are also imposed. The problem is treated with the help of an ansatz proposed for the derivative of the solution. The ansatz is the most general one compatible with the above mentioned requirements. The techniques are tested with exactly solvable examples. Inversions of the Lorentz, Stieltjes and Laplace integral
transforms are performed, and very satisfactory results are obtained. The method is useful, in particular, for the calculation of quantum--mechanical reaction amplitudes and inclusive spectra of perturbation-induced reactions in the framework of the integral transform approach.

Web link: ***www.IntellectualArchive.com/getfile.php?file=PiOlMt3vKIV&orig_file=Efros_PREfin.pdf***

ID #: 329 **Social Sciences** / **Economics** / **Financial**

Submitted on: May 06, 2012

Author: Carlos Pedro Goncalves

Title: **Quantum Financial Economics - Risk and Returns**

Abstract: Financial volatility risk and its relation to a business cycle-related intrinsic time is addressed through a multiple round evolutionary quantum game equilibrium leading to turbulence and multifractal signatures in the financial returns and in the risk dynamics. The model is simulated and the results are compared with actual financial volatility data.

Web link: ***www.IntellectualArchive.com/getfile.php?file=0Wp0JEOD7ZM&orig_file=C_P_Goncalves__Quantum_Financial_Economics.pdf***

ID #: 332 **Natural Sciences** / **Computer Sciences** / **Analysis of algorithms**

Submitted on: May 06, 2012

Author: Rami Cohen

Title: **The Chan-Vese Algorithm**

Abstract: Segmentation is the process of partitioning a digital image into multiple segments (sets of pixels). Such common segmentation tasks including segmenting written text or segmenting tumors from healthy brain tissue in an MRI image, etc. Chan-Vese model for active contours is a powerful and flexible method which is able to segment many types of images, including some that would be quite difficult to segment in means of "classical" segmentation - i.e., using thresholding or gradient based methods. This model is based on the Mumford-Shah functional for segmentation, and is used widely in the medical imaging field, especially for the segmentation of the brain, heart and trachea. The model is based on an energy minimization problem, which can be reformulated in the level set formulation, leading to an easier way to solve the problem. In this project, the model will be presented (there is an extension to color (vector-valued) images, but it will not be considered here),

and Matlab code that implements it will be introduced.

Web link: ***www.IntellectualArchive.com/getfile.php?file=8FpJAcPaLE5&orig_file=Rami_Cohen__The_Chan-Vese_Algorithm.pdf***

ID #: 333 **Social Sciences / Economics / Financial**

Submitted on: May 07, 2012

Author: Carlos Pedro Goncalves

Title: **Quantum Financial Economics of Games of Strategy and Financial Decisions**

Abstract: A quantum financial approach to finite games of strategy is addressed, with an extension of Nash`s theorem to the quantum financial setting, allowing for an entanglement of games of strategy with two-period financial allocation problems that are expressed in terms of: the consumption plans` optimization problem in pure exchange economies and the finite-state securities market optimization problem, thus addressing, within the financial setting, the interplay between companies` business games and financial agents` behavior. A complete set of quantum Arrow-Debreu prices, resulting from the game of strategy`s quantum Nash equilibrium, is shown to hold, even in the absence of securities` market completeness, such that Pareto optimal results are obtained without having to assume the completeness condition that the rank of the securities` payoff matrix is equal to the number of alternative lottery states.

Web link: ***www.IntellectualArchive.com/getfile.php?file=dPPPHp4dfST&orig_file=C_P_Goncalves__Quantum_Financial_Economics.pdf***

ID #: 334 **Natural Sciences / Mathematics / Dynamical systems**

Submitted on: May 07, 2012

Author: Eugeny A. Mityushov

Title: **Integration of Constraint Equations in Problems of a Disc and a Ball Rolling on a Horizontal Plane**

Abstract: The problem of a disc and a ball rolling on a horizontal plane without slipping is considered. Differential constrained equations are shown to be integrated when the trajectory of the point of contact is taken in a form of the natural equation, i.e. when the dependence of the curvature of the trajectory is explicitly expressed in terms of the distance passed by the point.

Web link: ***www.IntellectualArchive.com/getfile.php?file=qiDJIlLLCb9&orig_file=Eugeny_A_Mityushov__Problems_of_a_Disc.pdf***

ID #: 335 **Natural Sciences / Physics / Particle physics**

Submitted on: May 08, 2012

Author: Keiji Matsumoto

Title: **An asymptotic theory of cloning of classical state families**

Abstract: Cloning, or approximate cloning, is one of basic operations in quantum information processing. In this paper, we deal with cloning of classical states, or probability distribution in asymptotic setting. We study the quality of the approximate (n,rn)-clone, with n being very large and r being constant. The result turns out to be \parallel N(0,r1)-N(0,1)\paralell_1, where N({\mu},{\Sigma}) is the Gaussian distribution with mean {\mu} and covariance {\Sigma}. Notablly, this value does not depend on the the family of porbability distributions to be cloned. The key of the argument is use of local asymptotic normality: If the curve {\theta}\rightarrow P_{{\theta}} is sufficiently smooth in {\theta}, then, the behavior of P_{{\theta}`}^{\otimes n} where {\theta}`-{\theta}=o(\surd(1/n)), is approximated by Gaussian shift. Using this, we reduce the general case to Gaussian shift model.

Web link: ***www.IntellectualArchive.com/getfile.php?file=v8HoRgu0mIO&orig_file=Keiji_Matsumoto__Asymptotic_theory_of_cloning.pdf***

ID #: 336 **Natural Sciences / Computer Sciences / Analysis of algorithms**

Submitted on: May 08, 2012

Author: Yuriy Ostapov

Title: **Inference and Plausible Reasoning in a Natural Language Understanding System Based on Object-Oriented Semantics**

Abstract: Algorithms of inference in a computer system oriented to input and semantic processing of text information are presented. Such inference is necessary for logical questions when the direct

comparison of objects from a question and database can not give a result. The following classes of problems are considered: a check of hypotheses for persons and non-typical actions, the determination of persons and circumstances for non-typical actions, planning actions, the determination of event cause and state of persons. To form an answer both deduction and plausible reasoning are used. As a knowledge domain under consideration is social behavior of persons, plausible reasoning is based on laws of social psychology. Proposed algorithms of inference and plausible reasoning can be realized in computer systems closely connected with text processing (criminology, operation of business, medicine, document systems).

Web link: ***www.IntellectualArchive.com/getfile.php?file=SwjbBJCe9uS&orig_file=Yuriy_Ostapov__Inference_and_Plausible_Reasoning.pdf***

ID #: 337 **Natural Sciences / Computer Sciences / Analysis of algorithms**

Submitted on: May 08, 2012

Author: Yuriy Ostapov

Title: **Object-oriented semantics of English in natural language understanding system**

Abstract: A new approach to the problem of natural language understanding is proposed. The knowledge domain under consideration is the social behavior of people. English sentences are translated into set of predicates of a semantic database, which describe persons, occupations, organizations, projects, actions, events, messages, machines, things, animals, location and time of actions, relations between objects, thoughts, cause-and-effect relations, abstract objects. There is a knowledge base containing the description of semantics of objects (functions and structure), actions (motives and causes), and operations.

Web link: ***www.IntellectualArchive.com/getfile.php?file=GiqM6MfgjeN&orig_file=Yuriy_Ostapov__Object-oriented_semantics.pdf***

ID #: 338 **Natural Sciences / Mathematics / Geometry**

Submitted on: May 08, 2012

Author: Francisco-Javier Turiel

Title: **The Local Product Theorem for bihamiltonian structures**

Abstract: In this work one proves that, around each point of a dense open set (regular points), a real analytic or holomorphic bihamiltonian structure decomposes into a product of a Kronecker bihamiltonian structure and a symplectic one if a necessary condition on the characteristic polynomial of the symplectic factor holds. Moreover we give an example of bihamiltonian structure for showing that this result does not extend to the C^∞-category. Thus a classical problem on the geometric theory of bihamiltonian structures is solved at almost every point.

Web link: ***www.IntellectualArchive.com/getfile.php?file=8MggHmbPg7W&orig_file=Francisco-Javier_Turiel__The_Local_Product_Theorem.pdf***

ID #: 339 **Natural Sciences / Mathematics / Geometry**

Submitted on: May 08, 2012

Author: Francisco-Javier Turiel

Title: **On the local theory of Veronese webs**

Abstract: This work is an introduction to the local geometric theory of Veronese webs developed in the last twenty years. Among the different possible approach, here one has chosen the point of view of differential forms. Moreover, in order to make its reading easier, this text is self-contained in which directly regards Veronese webs.

Web link: ***www.IntellectualArchive.com/getfile.php?file=EDmpkfjNNNl&orig_file=Francisco-Javier_Turiel__Veronese_webs.pdf***

ID #: 340 **Natural Sciences / Physics / Optics**

Submitted on: May 08, 2012

Author: Weng W. Chow

Title: **Influences of excitation-dependent bandstructure changes on InGaN light-emitting diode efficiency**

Abstract: Bandstructure properties in wurtzite quantum wells can change appreciably with changing carrier density because of screening of quantum-confined Stark effect. An approach for incorporating these

changes in an InGaN light-emitting-diode model is described. Bandstructure is computed for different carrier densities by solving Poisson and k\cdotp equations in the envelop approximation. The information is used as input in a dynamical model for populations in momentum-resolved electron and hole states. Application of the approach is illustrated by modeling device internal quantum efficiency as a function of excitation.

Web link: ***www.IntellectualArchive.com/getfile.php?file=3WR6RxQqHDJ&orig_file=Weng_Chow__InGaN_light-emitting_diode_efficiency.pdf***

ID #: 341 **Natural Sciences** / **Physics** / **Particle physics**

Submitted on: May 10, 2012

Author: Ervin Goldfain

Title: **Fractional Field Theory and Physics Beyond the Standard Model**

Abstract: During the last decade, a number of important developments have surfaced concerning fractional dynamics and its applications in various branches of fundamental and applied science. In particular, fractional field theory (FFT) represents an active area of research in mathematical physics whose motivation stems, in part, from its ability to provide novel answers to many of the open questions surrounding quantum field theory (QFT), Standard Model for particle physics (SM) and quantum gravity theories (QG). We outline here a development agenda for FFT that is designed to recover SM in the low-energy limit and solve some of its seemingly intractable puzzles.

Web link: ***www.IntellectualArchive.com/getfile.php?file=gJfh0OvOLh4&orig_file=FFT and Physics beyond SM.pdf***

ID #: 342 **Natural Sciences** / **Physics** / **Particle physics**

Submitted on: May 10, 2012

Author: E. D. Vol

Title: **On the statistical description of classical open systems with integer variables by the Lindblad equation**

Abstract: We propose the consistent statistical approach to consider a wide class of classical open systems whose states are specified by a set of positive integers(occupation numbers).Such systems are often encountered in physics, chemistry, ecology, economics and other sciences.Our statistical method based on ideas of quantum theory of open systems takes into account both discreteness of the system variables and their time fluctuations - two effects which are ignored in usual mean field dynamical approach.The method let one to calculate the distribution function and (or)all moments of the system of interest at any instant.As descriptive examples illustrating the effectiveness of the method we consider some simple models:one relating to nonlinear mechanics,and others taken from population biology .In all this examples the results obtained by the method for large occupation numbers coincide with results of purely dynamical approach but for small numbers interesting differences and new effects arise.

Web link: ***www.IntellectualArchive.com/getfile.php?file=lAhdw9H3Dhe&orig_file=E_D_Vol__classical_open_systems.pdf***

ID #: 343 **Natural Sciences** / **Mathematics** / **Probability**

Submitted on: May 10, 2012

Author: Wen Lv

Title: **Backward stochastic Volterra integral equations associated with a Levy process and applications**

Abstract: In this paper, we study a class of backward stochastic Volterra integral equations driven by Teugels martingales associated with an independent L\`{e}vy process and an independent Brownian motion (BSVIELs). We prove the existence and uniqueness as well as stability of the adapted M-solutions for those equations. Moreover, a duality principle and then a comparison theorem are established. As an application, we derive a class of dynamic risk measures by means of M-solutions of certain BSVIELs.

Web link: ***www.IntellectualArchive.com/getfile.php?file=K1hhM3PKWT9&orig_file=Wen_Lv__Volterra_integral_equations.pdf***

ID #: 344 **Natural Sciences** / **Mathematics** / **Probability**

Submitted on: May 10, 2012

Author: Wen Lv

Title: **Reflected BSDE with stochastic Lipschitz coefficient**

Abstract: In this paper, we deal with a class of one-dimensional reflected backward stochastic differential equations with stochastic Lipschitz coefficient. We derive the existence and uniqueness of the solutions for those equations via Snell envelope and the fixed point theorem.

Web link: ***www.IntellectualArchive.com/getfile.php?file=9jLb0NdLeYZ&orig_file=Wen_Lv__Reflected_BSDE.pdf***

ID #: 345 **Natural Sciences** / **Mathematics** / **Probability**

Submitted on: May 10, 2012

Author: Wen Lv

Title: **L^p-solutions of Reflected Backward Doubly Stochastic Differential Equations**

Abstract: In this paper, we deal with a class of one-dimensional reflected backward doubly stochastic differential equations with one continuous lower barrier. We derive the existence and uniqueness of solutions for these equations with Lipschitz coefficients.

Web link: ***www.IntellectualArchive.com/getfile.php?file=8Ido3vtgOG5&orig_file=Wen_Lv__Lp-solutions_of_reflected_BSDE.pdf***

ID #: 346 **Natural Sciences** / **Physics** / **Heat and thermodynamics**

Submitted on: May 11, 2012

Author: V. T. Volov

Title: **The Energy Transformation Limit Theorem for Gas Flow Systems**

Abstract: The limit energy theorem which determines the possibility of transformation the energy flow in power systems in the absence of technical work is investigated and proved for such systems as gas lasers and plasmatrons, chemical gas reactors, vortex tubes, gas-acoustic and other systems, as well as a system of close stars. In the case of the same name ideal gas in the system the maximum ratio of energy conversion effectiveness is linked to the Carnot theorem, which in its turn is connected with the Nernst theorem. However, numerical analyses show that the class of flow energy systems is non-carnot one. The ratio of energy conversion effectiveness depends on the properties of the working medium; a conventional cycle in open-circuit is essentially irreversible. The proved theorem gives a more strongly worded II law of thermodynamics for the selected class of flow energy systems. Implications for astrophysical thermodynamic systems and the theory of a strong shock wave are discussed.

Web link: ***www.IntellectualArchive.com/getfile.php?file=oWirgMgjgfx&orig_file=V_Volov__Energy_Transformation_Limit_Theorem.pdf***

ID #: 347 **Natural Sciences** / **Mathematics** / **Probability**

Submitted on: May 11, 2012

Author: Marco Lenci

Title: **Random walks in random environments without ellipticity**

Abstract: We consider random walks in random environments on Z^d. Under a transitivity hypothesis that is much weaker than the customary ellipticity condition, and assuming an absolutely continuous invariant measure on the space of the environments, we prove the ergodicity of the annealed process w.r.t. the dynamics "from the point of view of the particle". This implies in particular that the environment viewed from the particle is ergodic. An immediate application of this result is to bistochastic environments. In this case, assuming zero local drift as well (martingale condition), we also prove the quenched Invariance Principle.

Web link: ***www.IntellectualArchive.com/getfile.php?file=MKOE4rgn8jH&orig_file=Marco_Lenci__Random_walks_in_random_environments.pdf***

ID #: 348 **Natural Sciences** / **Physics** / **Astrophysics**

Submitted on: May 11, 2012

Author: Irakli S. Nanobashvili

Title: **Two-Stream Instability as a Mechanism for Toroidal Magnetic Field Generation in the**

Magnetosphere of Crab Pulsar

Abstract: New plasma mechanism for the generation of toroidal magnetic field in the magnetosphere of Crab pulsar is presented. It is based on the development of two-stream instability in the relativistic electron-positron plasma of the pulsar magnetosphere. In particular, pulsar magnetosphere relativistic plasma is penetrated by ultrarelativistic electron beam and two-stream instability develops, as a result of which toroidal magnetic field is generated.

Web link: ***www.IntellectualArchive.com/getfile.php?file=iKc4O12xLQX&orig_file=Irakli_S_Nanobashvili__Two-Stream_Instability.pdf***

ID #: 349 **Natural Sciences / Physics / Mathematical Physics**

Submitted on: May 13, 2012

Author: Jiapu Zhang

Title: **A Simple But Effective Canonical Dual Theory Unified Algorithm for Global Optimization**

Abstract: Numerical global optimization methods are often very time consuming and could not be applied for high-dimensional nonconvex/nonsmooth optimization problems. Due to the nonconvexity/nonsmoothness, directly solving the primal problems sometimes is very difficult. This paper presents a very simple but very effective canonical duality theory (CDT) unified global optimization algorithm. This algorithm has convergence is proved in this paper. More important, for this CDT-unified algorithm, numerous numerical computational results show that it is very powerful not only for solving low-dimensional but also for solving high-dimensional nonconvex/nonsmooth optimization problems, and the global optimal solutions can be easily and elegantly got with zero dual gap.

By the way, this paper points out two research directions for CDT algorithm de-signing. One direction is to solve the canonical dual problems and another direction is to solve differential nonlinear (quadratic) equations of the the prime-dual Gao-Strang complementary problems of CDT. The author reserves the copyrights of all his ideas in this document and will specially write a book to address these two directional CDT algorithms soon.

Web link: ***www.IntellectualArchive.com/getfile.php?file=NWv9lUwGh8Y&orig_file=Jiapu_Zhang__A_Simple_But_Effective_Canonical_Dual_Theory.pdf***

ID #: 350 **Natural Sciences / Physics / Mathematical Physics**

Submitted on: May 13, 2012

Author: Jiapu Zhang

Title: **The Lennard-Jones PotentialMinimization Problem for Prion AGAAAAGA Amyloid Fibril Molecular Modeling**

Abstract: The simplified Lennard-Jones (LJ) potential minimization problem is minimize f(x)... subject to x from R(n), where □ij = (x3iâˆ'2âˆ'x3jâˆ'2)2+(x3iâˆ'1âˆ'x3jâˆ'1)2+(x3iâˆ'x3j)2, (x3iâˆ'2, x3iâˆ'1, x3i) is the co-ordinates of atom i in R3, i, j = 1, 2, . . . ,N (>1 integer), n = 3N and N is the whole number of atoms. The nonconvexity of the objective function and the huge number of local minima, which is growing exponentially with N, interest many mathematical optimization experts. The global minimizer should be just at the point of the bottom of the LJ potential well. Based on this point, this paper tackles this problem illuminated by amyloid fibril molecular model building. The 3nhc.pdb, 3nve.pdb, 3nvf.pdb, 3nvg.pdb and 3nvh.pdb of PDB bank are used for the successful molecular modeling.

Web link: ***www.IntellectualArchive.com/getfile.php?file=iIKLWKnSZiv&orig_file=Jiapu_Zhang__The_Lennard_Jones_Potential_Minimization.pdf***

ID #: 351 **Natural Sciences / Physics / Quantum field theory**

Submitted on: May 14, 2012

Author: A. Garces Doz

Title: **The God Particle: the Higgs Boson, Extra Dimensions and the Particle in a Box**

Abstract: In this paper we show as the lightest Higgs boson, is directly linked to the existence of seven dimensions compacted Kaluza-Klein type, and four extended. The model of a particle in a box allows us to calculate, using the extra dimensions as entries in the well-known equations of this model, the mass of the lightest Higgs boson. This estimate coincides with complete accuracy with that obtained in our previous work, "God and His Creation: The Universe", using the well known quantum mechanical model of a particle in a spherically symmetric potential. Both load match and result in a

mass for the lightest Higgs boson of 126.23 Gev - 126.17 Gev

Web link: ***www.IntellectualArchive.com/getfile.php?file=PfUHuHQXZ6u&orig_file=1204.0038v1.pdf***

ID #: 352 **Natural Sciences / Other / Trans-Disciplinarian**

Submitted on: May 14, 2012

Author: Diego Lucio Rapoport

Title: **HYPER KLEIN BOTTLE LOGOPHYSICS ONTOPOIESIS OF THE COSMOS AND LIFE**

Abstract: We present an ontoepistemology based on the self-contained KleinBottle and HyperKleinBottle and their logics; the latter incorporates interrelations and hypercontextualizations within an heterarchy of Otherness. We present the associated logophysics, as a basis for the unification of science and phenomenology, by surmounting the Cartesian Cut. Dualism is found to be a projection of the former logic, not an independent primeval ontoepistemology. We present the phenomenology of these logics, with regards to the geometries and topologies of space and time, of thought and language, of semiosis and its geological, cosmological and astronomical signs linked to the Myth of Eternal Return, of perception and cognition, of the ontopoiesis of life and the inanimate realms, and of biological shape departing from embryological development and its unfolding as bodyplans and their anatomy-physiology, and discuss its bearing in evolution theory, all which we present as embodiments of this non-dual ontoepistemology. We contrast this paradigm with: 1) the dualism of the theory of autopoiesis and the purported interior/exterior divide, as a general principle, which these logics subvert by self and mutual reentrances of the heterarchies; 2) the dual membrane of cell biology; 3) evolutionary theory associated to the metabolic versus genomic dualism; 4) the mereological phallacies of the neurosciences and the hypercontextuality of metaphors and anthropomorphisms; 5) the dualisms of Newtonian physics, Einstein`s relativity and quantum mechanics which are found to be epistemic theories and the assumption of non-contextualization in physics, chemistry and geology; 6) the psychophysics of visual, aural and musical spaces, 7) the anatomy-physiology of the sensorium and the healing reconstitution of integrity, and, 8) in the division of epistemology and ontology, of language and process, and the top-down and bottom-up systemics. We present their surmountal through the ontoepistemologies of the Klein and Hyper-Klein Bottles surfaces, of hypercontextualization and complexity. We discuss teleo-logical causation and design of processes/structures, in particular in paleogeology, physics, chemistry and biology, in terms of the latter ontoepistemologies and the Golden Mean, generated by time waves and their guidance by the Fibonacci Algorith. We apply this ontoepistemology to the interpretation of religious texts and discuss the relations with the evolution of science.

Web link: ***semi-private registratrion***

ID #: 358 **Social Sciences / Economics / Financial**

Submitted on: May 15, 2012

Author: Andrei N. Soklakov

Title: **Learning, investments and derivatives**

Abstract: The recent crisis and the following flight to simplicity put most derivative businesses around the world under considerable pressure. We argue that the traditional modeling techniques must be extended to include product design. We propose a quantitative framework for creating products which meet the challenge of being optimal from the investors point of view while remaining relatively simple and transparent.

Web link: ***www.IntellectualArchive.com/getfile.php?file=sR4jOrLsvlA&orig_file=Andrei_Soklakov__Learning_investments_and_derivatives.pdf***

ID #: 359 **Natural Sciences / Physics / Mathematical Physics**

Submitted on: May 16, 2012

Author: Malcolm Macleod

Title: **Fine structure constant and square root of Planck momentum**

Abstract: The natural constants G, h, e and m_e are commonly used but are themselves difficult to measure experimentally with a high precision. Defining the Planck Ampere in terms of the square root of Planck momentum, referred to here as Quintessence momentum, and by assigning a formula for the

electron as a magnetic monopole in terms of e and c, a formula for the Rydberg constant can be derived. G, h, e and m_e can then each be written in terms of more precise constants; the speed of light c (fixed value), the Rydberg constant (12 digit precision) and alpha, the fine structure constant (10 digit precision).

Web link: ***www.IntellectualArchive.com/getfile.php?file=0ctjXD6gOiJ&orig_file=momentum.pdf***

ID #: 360 **Social Sciences** / **Economics** / **Financial**

Submitted on: May 16, 2012

Author: Takashi Kato

Title: **An Optimal Execution Problem in Geometric Ornstein-Uhlenbeck Price Process**

Abstract: We study the optimal execution problem in the presence of market impact and give a generalization of the main result of Kato(2009). Then we consider an example where the security price follows a geometric Ornstein-Uhlenbeck process which has the so-called mean-reverting property, and then show that an optimal strategy is a mixture of initial/terminal block liquidation and intermediate gradual liquidation. When the security price has no volatility, the form of our optimal strategy is the same as results of Obizhaeva and Wang(2005) and Alfonsi et al.(2010), who studied the optimal execution in a limit-order-book model.

Web link: ***www.IntellectualArchive.com/getfile.php?file=XxMi1S9JcxF&orig_file=Takashi_Kato__Geometric_Ornstein-Uhlenbeck_Price_Process.pdf***

ID #: 361 **Social Sciences** / **Economics** / **Financial**

Submitted on: May 16, 2012

Author: Takashi Kato

Title: **An Optimal Execution Problem with Market Impact**

Abstract: We study an optimal execution problem in a market model which considers market impact. First we study a discrete-time model and describe a value function. Then, by shortening the intervals of the execution times, we derive the value function of a continuous-time model and study some of its properties (continuity, semi-group property and viscosity property). We show that these vary with the strength of the market impact. We introduce some examples which show that the forms of the optimal strategies change completely, depending on the amount of the trader`s security holdings.

Web link: ***www.IntellectualArchive.com/getfile.php?file=aAFvPOKPSCI&orig_file=Takashi_Kato__Market_Impact.pdf***

ID #: 362 **Natural Sciences** / **Computer Sciences** / **Evolutionary computation**

Submitted on: May 16, 2012

Author: Thomas Sperl

Title: **Taking the redpill: Artificial Evolution in native x86 systems**

Abstract: In analogon to successful artificial evolution simulations as Tierra or avida, this text presents a way to perform artificial evolution in a native x86 system. The implementation of the artificial chemistry and first results of statistical experiments are presented.

Web link: ***www.IntellectualArchive.com/getfile.php?file=L7eTKv1RJh1&orig_file=Thomas_Sperl__Artificial_Evolution_in_native_x86_systems.pdf***

ID #: 363 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 16, 2012

Author: A. V. Stoyanovsky

Title: **Quantization on space-like surfaces**

Abstract: We give a mathematical definition of dynamical evolution in quantum field theory, including evolution on space-like surfaces, and show its relationship with the axiomatic and perturbative approaches to QFT.

Web link: ***www.IntellectualArchive.com/getfile.php?file=QmdixojZ97L&orig_file=A_V_Stoyanovsky__Quantization_on_space-like_surfaces.pdf***

ID #: 364 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 16, 2012

Author: A. V. Stoyanovsky

Title: **Mathematical definition of quantum field theory on a manifold**

Abstract: We give a mathematical definition of quantum field theory on a manifold, and definition of quantization of a classical field theory given by a variational principle.

Web link: ***www.IntellectualArchive.com/getfile.php?file=LFIVw1Sn09K&orig_file=A_V_Stoyanovsky__quantum_field_theory_on_a_manifold.pdf***

ID #: 365 **Natural Sciences** / **Physics** / **Econophysics**

Submitted on: May 18, 2012

Author: V.Volov

Title: **Fractal-Cluster Theory of Resource Distribution in Socio-Economic Systems**

Abstract: Abstract
The fundamentals of fractal-cluster theory, including fractal-cluster correlation (FCC), the dynamic equations of the fractal-cluster system evolution and the criteria for the complex systems management are presented. The analysis of economic systems management is performed on the basis of the synthesis of I.Prigogine`s thermodynamics of structure foundations and fractal-cluster correlation.
The article shows the correlation between the fractal-cluster and the traditional economic analysis for economic systems. The singularity of the fractal-cluster theory lies in the possibility to optimize the budget distribution under undetermined conditions and to predict possible crisis tendencies in the economic system development in advance.
The purpose of the given research is to work out the analytical apparatus for sustained resource distribution analysis of a complex self-organizing system, which is based on I.Prigogine`s thermodynamics structure and V.P Burdakov`s fractal-cluster correlations. The optimization of resource distribution is especially important for such socioeconomic systems as fundamental science, education, social sphere. The information about the cost of a thing produced in such systems is insufficient. Due to this fact, V. Leontief`s classical models of input-output balance (static and dynamic) do not work.
The analysis confirmed that the most efficient management of resource distribution is carried out by the Fibonacci sequence with the help of the new mathematical apparatus based on the Golden Section [A.Stakhov, 2005-2006].

Web link: ***www.IntellectualArchive.com/getfile.php?file=XT5KNNXGOjC&orig_file=Article.doc***

ID #: 366 **Natural Sciences** / **Physics** / **Astrophysics**

Submitted on: May 18, 2012

Author: C. Sivaram

Title: **Hydrodynamics, horizons, holography and black hole entropy**

Abstract: The usual discussions about black hole dynamics involve analogies with laws of thermodynamics especially in connection with black hole entropy and the associated holographic principle. We explore complementary aspects involving hydrodynamics of the horizon geometry through the membrane paradigm. New conceptual connections complementing usual thermodynamic arguments suggest deep links between diverse topics like black hole decay, quantum circulation and viscosity. Intriguing connections between turbulence cascades, quantum diffusion via quantum paths following Fokker- Planck equation and Hawking decay also result from this combination of thermodynamic and hydrodynamic analogies to black hole dynamics.

Web link: ***www.IntellectualArchive.com/getfile.php?file=AAi22BoXKP4&orig_file=C_Sivaram__Hydrodynamics_horizons_and_black_hole_entropy.pdf***

ID #: 367 **Natural Sciences** / **Physics** / **Biophysics**

Submitted on: May 18, 2012

Author: V.V. Matveev, D.V. Prokhorenko, N.V. Puzyrnikova

Title: **Thermodynamics of pharmacological action for electron-accepting compounds on activated or damaged cell in the context of Ling`s model of the living cell**

Abstract: The theory describing action of medicines explored in this paper is based on assumption that vital

activity of the cell may be described in terms of the model of two states: resting state and excitation. According to available physiological data excitation state is dangerous for cell and may cause different pathological changes, including "conformational" diseases, due to protein aggregation. Normally, the excitation is completely reversible and the key role is played here by ATP (adenosine-5`-triphosphate) which disaggregates proteins of cytomatrix. The same effect ATP exerts during cell injury by eliciting a "healing" effect. Damage of cell structures we consider as "illness", whereas removal of pathological consequences caused by protein aggregation of any origin we will call "a cure". The latter is considered as physical process of cell recovering from excitation/injury to resting state, which is analyzed in terms of our generalized thermodynamics.

Web link: ***www.IntellectualArchive.com/getfile.php?file=rQfFYwKFvQt&orig_file=D_V_Prokhorenko__Thermodynamics_of_pharmacological_action.pdf***

ID #: 368 **Natural Sciences** / **Physics** / **Biophysics**

Submitted on: May 18, 2012

Author: D.V. Prokhorenko, V.V. Matveev

Title: **Two models of protoplasm microstructure of the living cell in resting state**

Abstract: In order to develop the methods of thermodynamic analysis for the living cell, two models of protoplasm microstructure of the living cell in resting state were suggested. Both models are based on the assumption that the Ling`s cell as a statistical mechanics system is non-ergodic. In the first, Van der Waals model, the protein-protein interactions, which form the physical basis for the cell functioning, are considered as a interactions of key importance. It is postulated that protein molecules are situated in points of some space lattice (the Ling model of a cell) they assemble to aggregates at equilibrium state, corresponding to the dead protoplasm. In the second model we consider protein conformation at the resting state and conformation changes while the cell is passing from the resting state to the equilibrium state (dead protoplasm).

Web link: ***www.IntellectualArchive.com/getfile.php?file=fillmtqKN3m&orig_file=D_V_Prokhorenko__Two_models_of_protoplasm_microstructure.pdf***

ID #: 369 **Natural Sciences** / **Physics** / **Biophysics**

Submitted on: May 18, 2012

Author: D.V. Prokhorenko, V.V. Matveev

Title: **The Significance of Non-ergodicity Property of Statistical Mechanics Systems for Understanding Resting State of a Living Cell**

Abstract: A better grasp of the physical foundations of life is necessary before we can understand the processes occurring inside a living cell. In his physical theory of the cell, American physiologist Gilbert Ling introduced an important notion of the resting state of the cell. He describes this state as an independent stable thermodynamic state of a living substance in which it has stored all the energy it needs to perform all kinds of biological work. This state is characterised by lower entropy of the system than in an active state. However, Ling`s approach is primarily qualitative in terms of thermodynamics and it needs to be characterised more specifically. To this end, we propose a new thermodynamic approach to studying Ling`s model of the living cell (Ling`s cell), the center piece of which is the non-ergodicity property which has recently been proved for a wide range of systems in statistical mechanics.

Web link: ***www.IntellectualArchive.com/getfile.php?file=3E9j853JpHr&orig_file=D_V_Prokhorenko__The_Significance_of_Non-ergodicity_Property.pdf***

ID #: 370 **Natural Sciences** / **Physics** / **Biophysics**

Submitted on: May 18, 2012

Author: D.V. Prokhorenko

Title: **On Non Ergodic Property of Bose Gas with Weak Pair Interaction**

Abstract: In this paper we prove that Bose gas with weak pair interaction is non ergodic system. In order to prove this fact we consider the divergences in some nonequilibrium diagram technique. These divergences are analogous to the divergences in the kinetic equations discovered by Cohen and Dorfman. We develop the general theory of renormalization of such divergences and illustrate it with some simple examples. The fact that the system is non ergodic leads to the following consequence: to prove that the system tends to the thermal equilibrium we should take into account its behavior on its boundary. In this paper we illustrate this thesis with the Bogoliubov derivation of the kinetic equations.

Web link: ***www.IntellectualArchive.com/getfile.php?file=K6Bml5BZ8cI&orig_file=D_V_Prokhorenko__On_Non_Ergodic_Property_of_Bose_Gas.pdf***

ID #: 371 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 18, 2012

Author: A.E. Shalyt-Margolin

Title: **Deformed Quantum Field Theory, Thermodynamics at Low and High Energies, and Gravity. I**

Abstract: In this work, within the scope of the Generalized Uncertainty Principle, a model of the high energy deformation for a particular case of Einstein`s equations is developed. In the process a thermodynamic description of General Relativity is used. And the deformation is understood as an extension of a particular theory by inclusion of one or several additional parameters in such a way that the initial theory appears in the limiting transition. The possibility for the high energy deformation of Einstein`s equations within the scope of both equilibrium thermodynamics and non-equilibrium thermodynamics is examined.
The online version is also available on arXiv.org as document 1003.4523

Web link: ***www.IntellectualArchive.com/getfile.php?file=EivNleiQi50&orig_file=A_E_Shalyt-Margolin__Deformed_Quantum_Field_Theory.pdf***

ID #: 372 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 18, 2012

Author: A. E.Shalyt-Margolin

Title: **Deformed Quantum Field Theory, Thermodynamics at Low and High Energies, and Gravity. II. Deformation Parameter**

Abstract: In the work it is demonstrated that with the use of one and the same parameter deformation may be described for several cases of the General Relativity within the scope of both the Generalized Uncertainty Principle (UV-cutoff) and the Extended Uncertainty Principle (IR-cutoff). All these cases have a common thermodynamic interpretation of the corresponding gravitational equations. Consideration is given to the possibility for extension of the obtained results to more general cases. Possible generalization of the uncertainty relation for the pair (cosmological constant, "space-time volume"), where the cosmological constant is regarded as a dynamic quantity at high and low energies is analyzed.
The article was printed in the International Journal of Theoretical and Mathematical Physics (Vol.2, No.3, May 2012). The online version is also available on arXiv.org as document 1006.4979

Web link: ***www.IntellectualArchive.com/getfile.php?file=2OkB9LMElds&orig_file=A_E_Shalyt-Margolin__Deformed_Quantum_Field_Theory_2.pdf***

ID #: 373 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 18, 2012

Author: A.E. Shalyt-Margolin

Title: **Quantum Theory at Planck Scale, Limiting Values, Deformed Gravity and Dark Energy Problem**

Abstract: Within a theory of the existing fundamental length on the order of Planck`s a high-energy deformation of the General Relativity for the space with horizon has been constructed. On this basis, Markov`s work of the early eighties of the last century has been given a new interpretation to show that the heuristic model considered by him may be placed on a fundamental footing. The obtained results have been applied to solving of the dark energy problem, making it possible to frame the following hypothesis: a dynamic cosmological term is a measure of deviation from a thermodynamic identity (the first law of thermodynamics) of the high-energy (Planck`s) deformation of Einstein equations for horizon spaces in their thermodynamic interpretation.
The article was printed in the International Journal of Modern Physics D,Vol. 21, No. 2 (2012),1250013. The online version is also available on arXiv.org as document 1102.5084

Web link: ***www.IntellectualArchive.com/getfile.php?file=Dc4QSGL74NN&orig_file=A_E_Shalyt-Margolin__Quantum_Theory_at_Planck_Scale.pdf***

ID #: 374 **Natural Sciences** / **Mathematics** / **Algebra**

Submitted on: May 21, 2012

Author: Alfonso Bustamante

Title: **Link Algebra: A new aproach to graph theory**

Abstract: In this paper we develop a structure called Link Algebra, in which we present a Set with two binary operations and an axiom system developed from the study of graph theory and set/antiset theory, sowing main theorems and definitions. Once introduced Link Algebra, we will show the aplication on graph theory, like defining Paths, cycles and stars. Finally, we will se an alternative axiomatizations with Multisets and ordered pairs to algebraicaly define mutli, pseudo and oriented graphs.

Web link: ***www.IntellectualArchive.com/getfile.php?file=J2LCgTbpGVa&orig_file=Alfonso_Bustamante__Link_Algebra.pdf***

ID #: 375 **Natural Sciences** / **Computer Sciences** / **Evolutionary computation**

Submitted on: May 21, 2012

Author: Thomas Sperl

Title: **Imitation of Life: Advanced system for native Artificial Evolution**

Abstract: A model for artificial evolution in native x86 Windows systems has been developed at the end of 2010. In this text, further improvements and additional analogies to natural microbiologic processes are presented. Several experiments indicate the capability of the system - and raise the question of possible countermeasures.

Web link: ***www.IntellectualArchive.com/getfile.php?file=NkenKOH9JFt&orig_file=Thomas_Sperl__Imitation_of_Life.pdf***

ID #: 376 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 21, 2012

Author: A. V. Stoyanovsky

Title: **No-Counterterm approach to quantum field theory**

Abstract: We give a conjectural way for computing the S-matrix and the correlation functions in quantum field theory beyond perturbation theory. The basic idea seems universal and naively simple: to compute the physical quantities one should consider the functional differential Schrodinger equation (without normal orderings), regularize it, consider the regularized evolution operator in the Fock space from $t=T_1$ to $t=T_2$, where the interval (T_1,T_2) contains the support of the interaction cutoff function, remove regularization (without adding counterterms), and tend the interaction cutoff function to a constant. We call this approach to QFT the No-Counterterm approach. We show how to compute the No-Counterterm perturbation series for the ϕ^4 model in R^{d+1}. We give rough estimates which show that some summands of this perturbation series are finite without renormalization (in particular, one-loop integrals for $d=3$ and all integrals for $d\ge 6$).

Web link: ***www.IntellectualArchive.com/getfile.php?file=KgeK40QE2BI&orig_file=A_V_Stoyanovsky__No-Counterterm_approach_to_quantum_field_theory.pdf***

ID #: 377 **Natural Sciences** / **Physics** / **Quantum field theory**

Submitted on: May 21, 2012

Author: A. V. Stoyanovsky

Title: **Differential operators on infinite dimensional space and quantum field theory**

Abstract: We conjecture that the renormalized perturbative S-matrix of quantum field theory coincides with the evolution operator of the standard functional differential Schrodinger equation whose right hand side (quantum local Hamiltonian) is understood as an element of an appropriate quantization of the Poisson algebra of classical field theory Hamiltonians. We show how to construct a quantization of this algebra, close to the algebra of differential operators on infinite dimensional space, but seemingly not appropriate for quantum field theory.

Web link: ***www.IntellectualArchive.com/getfile.php?file=AOliH3K35qg&orig_file=A_V_Stoyanovsky__Differential_operators_on_infinite_dimensional_space.pdf***

ID #: 378 **Natural Sciences** / **Physics** / **Relativity**

Submitted on: May 22, 2012

Author: V.Volov

Title: **HYDRO DYNAMIC THEORY OF QUASIGRAVITY**

Abstract: Abstract

In the present work there was found a class of noninertial frames of reference, which satisfy Einstein `equivalency` principle more than the known noninertial frames - these are strongly swirling gaseous flows.
Field intensity and potential in the mentioned frames of reference are similar to the corresponding values of natural gravity fields, but have the opposite sign. Scalar curvature of this space is negative and proportional to absolute gas temperature .
There was obtained a new solution of Einstein equation which refers to type I in Petrov`s classification for cylindrical symmetrical swirling ideal gas with variable angular velocity and nonzero pressure. The equation of state has a more complicated form than the known equations of state in the theory of the vacuum.

Web link: ***www.IntellectualArchive.com/getfile.php?file=LEj90AjAmTW&orig_file=HYDRO DYNAMIC THEORY.doc final.doc***

ID #: 383 **Natural Sciences / Mathematics / Algebra**

Submitted on: May 24, 2012

Author: Alexander N. Skiba

Title: **On a question of L.A. Shemetkov concerning the intersection of F-maximal subgroups of finite groups**

Abstract: We investigate the influence of the intersection of the F-maximal subgroups on the structure of a finite group. In particular, answering a question of L.A Shemetkov we give conditions under which a hereditary saturated formation F has a property that for any finite group G, the F-hypercentre of G coincides with the intersection of all F-maximal subgroups of G.

Web link: ***www.IntellectualArchive.com/getfile.php?file=1qfoWfQPhrT&orig_file=Alexander_Skiba__On_a_question_of_Shemetkov.pdf***

ID #: 386 **Natural Sciences / Physics / Mathematical Physics**

Submitted on: May 25, 2012

Author: Y Shang

Title: **The vertex degree of a hierarchical long-range percolation graph**

Abstract: The use of percolation theory in statistical physics has long been recognized. In this letter, we consider percolation in the hierarchical lattice of order N where the probability of connection between two nodes separated by distance k is of the form $1-e^{-\frac{\alpha}{\beta^k}}$, $\alpha\ge0$ and $\beta>0$. The vertex degrees of the resulting percolation graph are studied, which are consistent with the phase diagram of this model.

Web link: ***www.IntellectualArchive.com/getfile.php?file=UWk9s4PTsm0&orig_file=hierarchical long-range percolation graph.pdf***

ID #: 387 **Natural Sciences / Other / Materials science**

Submitted on: May 25, 2012

Author: Simakov S.K.

Title: **Metastable nanosized diamond formation from a C-H-O fluid system**

Abstract: The model of nanosized diamond particles formation at metastable P-T parameters from a C-H-O fluid system is presented. It explains the hydrothermal formation and growth of diamond and the specifics of chemical vapor deposition (CVD) diamond synthesis gas mixtures at low P-T parameters. Further, the model explains the genesis of interstellar nanodiamond formations in space and the genesis of metamorphic mic7rodiamonds in shallow depth Earth rocks. In contrast to models where many possible reactions are considered, the present model makes the simplest possible assumptions about the key processes, and is then able to account for various tendencies seen in experimental data

Web link: ***www.IntellectualArchive.com/getfile.php?file=rXSPwflhXN0&orig_file=0AF1F8.PDF***

ID #: 390 **Natural Sciences / Chemistry / Organic chemistry**

Submitted on: May 26, 2012

Author: Simakov S.K.

Title: **Perspectives of nanodiamond formation from the organic matter at low P-T parameters.**

Abstract: The perspectives of nanosized diamond particles formation at metastable P-T parameters from organic matter at hydrothermal conditions is discussed. From the known data it`s possible to conclude that we could provide the hydrothermal syntheses of nanodiamonds from the water-oil or water-alhocol-oil solutions

Web link: ***www.IntellectualArchive.com/getfile.php?file=EUSQMhP4SsY&orig_file=NATR-OIL.PDF***

ID #: 391 **Natural Sciences** / **Chemistry** / **Organic chemistry**

Submitted on: May 26, 2012

Author: Simakov S.K., Kalmykov A.E., Sorokin L.M., Novikov M.P., Drozdova I.A., Yagovkina M.A., Grebenshchikova E.A

Title: **Chaoite formation from carbon-bearing fluid at low PT parameters**

Abstract: Microne sized chaoite particles were synthesised at 500 C and 1 kbar from organic solutions.

Web link: ***www.IntellectualArchive.com/getfile.php?file=uOB2hE1BR8C&orig_file=TRES1289.PDF***

ID #: 392 **Natural Sciences** / **Chemistry** / **Organic chemistry**

Submitted on: May 26, 2012

Author: Simakov S.K., Grafchikov A.A., Sirotkin A.K., Drozdova I.A., Lapshin A.E., Grebenshchikova E.A

Title: **Synthesis of Carbon Nanotubes and Fullerite Structures at PT Parameters Corresponding to Natural Mineral Formation**

Abstract: Carbon Nanotubes and Fullerite Structures were synthesised at 700 C and 5 kbar from organic matter (polypropylene)

Web link: ***www.IntellectualArchive.com/getfile.php?file=3Z3bSfJJKlu&orig_file=TRES87.PDF***

ID #: 393 **Natural Sciences** / **Earth Sciences** / **Geology**

Submitted on: May 26, 2012

Author: Simakov S.K.,

Title: **Redox state of eclogites and peridotites from sub-cratonic upper mantle and a connection with diamond genesis**

Abstract: Grt-Cpx oxygen barometer was worked out for the peridotitic and eclogitic parageneses. Oxygen fugacities and fluid compositions were estimated for kimberlitic diamonds and kimberlitic xenoliths on the basis of this sensor.

Web link: ***www.IntellectualArchive.com/getfile.php?file=DHXqbQdtQGg&orig_file=SIM-06.PDF***

ID #: 394 **Natural Sciences** / **Earth Sciences** / **Geology**

Submitted on: May 26, 2012

Author: Simakov S.K.

Title: **Garnet-clinopyroxene and clinopyroxene geothermobarometry of deep mantle and crust eclogites and peridotites.**

Abstract: Garnet-clinopyroxene and clinopyroxene barometers are proposed for mantle eclogites and peridotites on the basis of CaTs solubility in clinopyroxene coexisting with garnet. Such barometers permit estimation of P-T conditions for eclogite and peridotite garnet-clinopyroxene assemblages, including those involving omphacite and Cr-diopside pyroxenes for the ranges 700 < T < 2100 C and 1.5 < P < 22 GPa. The barometers were used to determine formation conditions of eclogitic and peridotitic inclusions in diamonds, diamondbearing, diamond-graphite-bearing and diamond-free eclogites and peridotites from kimberlite pipes and metamorphic complexes.

Web link: ***semi-private registratrion***

ID #: 395 **Natural Sciences** / **Earth Sciences** / **Geology**

Submitted on: May 26, 2012

Author: Simakov S.K.

Title: **Redox state of Earth`s upper mantle peridotites under the ancient cratons and its connection with diamond genesis**

Abstract: Grt-(Opx-Ol) oxygen barometer for peridotic parageneses was worked out.Rredox state and fluid composition for mantle diamonds and parageneses were estimated on the basis of the sensor.

Web link: ***semi-private registratrion***

ID #: 396 **Natural Sciences** / **Earth Sciences** / **Geology**

Submitted on: May 26, 2012

Author: Simakov S.K.

Title: **Nanodiamond Formation in natural processes from fluid systems at low P-T parameters**

Abstract: The paper presents a new physicochemical model of the formation of nanosized diamonds from an OHC fluid system under low temperature and pressure conditions corresponding to the graphite stability
area. This model in general explains the specific features of the composition of gas mixtures for CVD and hydrothermal synthesis in terms of diamond growth and formation under metastable conditions. It also
explains the origin of nanodiamonds and microdiamonds in metamorphic rocks of the Earth`s crust and the genesis of nanodiamonds in outer space at low temperatures and pressures.

Web link: ***www.IntellectualArchive.com/getfile.php?file=gqe235MZ57f&orig_file=TRES148.PDF***

ID #: 398 **Natural Sciences** / **Computer Sciences** / **Analysis of algorithms**

Submitted on: May 29, 2012

Author: Serghienko

Title: **Mathematical Modeling in Delphi**

Abstract: The literature on Delphi numbers many manuals. However among them there are few books, oriented to the solution of scientific and technical problems. The work contains the examples of programs in Delphi. Depending on the type of problems it is convenient to use or graphic (usual), or console applications of Delphi. Graphic applications are applicable for the plotting of functions. Console applications are applicable especially, when we needn`t the visualization, and it is necessary to introduce by hand lots of data. One can tell the console applications from the graphic ones with the presence of the next line in the text of program: {$APPTYPE CONSOLE}

Web link: ***www.IntellectualArchive.com/getfile.php?file=edruKiAjL9E&orig_file=Andrei V. Serghienko. Mathematical Modeling in Delphi.pdf***

ID #: 399 **Natural Sciences** / **Physics** / **Electromagnetism**

Submitted on: May 29, 2012

Author: Peter Romanets

Title: **Electron gas under the discontinuous magnetic field of cylindrical symmetry**

Abstract: We study the states of 3D-electron gas in non-homogeneous magnetic field. It is supposed that the step of magnetic field, at which field changes its sign, lies on the cylindrical surface. The eigen value problem is solved for are different parameters of the system. The equilibrium statistics in the limit of large quantum lifetime are considered as well. It is predicted that the system characterized by quasi-zero-dimensional spectra with large density of states; snakes orbits lead to the effective charge transfer; an appearance of the magnetic field step strongly modify the coordinate dependence of carriers concentration.

Web link: ***www.IntellectualArchive.com/getfile.php?file=5K4HXLi7dRE&orig_file=1105.0578v3.pdf***

ID #: 401 **Natural Sciences** / **Mathematics** / **Numerical analysis**

Submitted on: May 29, 2012

Author: Jiapu Zhang

Title: **A Simple But Effective Canonical Dual Theory Unified Algorithm for Global Optimization**

Abstract: Numerical global optimization methods are often very time consuming and could not be applied for high-dimensional nonconvex/nonsmooth optimization problems. Due to the nonconvexity/nonsmoothness, directly solving the primal problems sometimes is very difficult. This paper presents a very simple but very effective canonical duality theory (CDT) unified global optimization algorithm. This algorithm has convergence is proved in this paper. More important, for this CDT-unified algorithm, numerous numerical computational results show that it is very powerful not only for solving low-dimensional but also for solving high-dimensional nonconvex/nonsmooth optimization problems, and the global optimal solutions can be easily and elegantly got with zero dual gap.

Web link: ***www.IntellectualArchive.com/getfile.php?file=XKKjlroY9RL&orig_file=1105.2270v5 A Simple But Effective Canonical Dual Theory Unified Algorithm for Global Optimization.pdf***

ID #: 404 **Natural Sciences** / **Mathematics** / **Algebra**

Submitted on: May 30, 2012

Author: Josimar da Silva Rocha and Said Najati Sidki

Title: **The n-ary adding machine and soluble groups.**

Abstract: We describe under a various conditions abelian subgroups of the automorphism group Aut(Tn) of the regular n-ary tree Tn, which are normalized by the n-ary adding machine Ï„=(e,...,e,Ï„)Ïƒ, where Ï„ isthe n-cycle (0, 1, ..., n-1). As an application, for n = p a prime number, and for n = p^2 when p = 2, we prove that every finitely generated soluble subgroup of Aut(Tn), containing Ï„ is an extension of a torsion-free metabelian group by a finite group.

Web link: ***www.IntellectualArchive.com/getfile.php?file=MVwgHrhhv3p&orig_file=ASubmeter.pdf***

ID #: 405 **Natural Sciences** / **Physics** / **Electromagnetism**

Submitted on: May 30, 2012

Author: Asoke N. Mitra

Title: **Can Environmental Decoherence be Reversed for an Open Quantum System in a Magnetic field ?**

Abstract: A simple model is considered for an open system consisting of an aggregation of magnetic particles (like greigite) in the presence of a magnetic field (H), and interacting linearly with a bath of 3D harmonic oscillators. Using the Feynman-Vernon formalism, as given in Weiss (termed FVW), the time-evolved reduced density matrix (after eliminating the bath d.o.f.`s), is examined for environmental decoherence as defined in the FVW formalism. While decoherence is usually positive for most two-way couplings with the environment, it is found that a $three-way$ interaction involving the system plus bath plus H-field all together, can facilitate a $reversal$ of sign of this quantity ! This may have implications for quantum coherence based phenomena in the origins of life.

Web link: ***www.IntellectualArchive.com/getfile.php?file=jgljNmwPUSJ&orig_file=Magnetic coherence.pdf***

ID #: 408 **Natural Sciences** / **Physics** / **Heat and thermodynamics**

Submitted on: May 31, 2012

Author: V.Volov

Title: **The Energy Transformation Limit Theorem for Gas Flow Systems**

Abstract: Abstract
The limit energy theorem which determines the possibility of transformation the energy flow in power systems in the absence of technical work is investigated and proved for such systems as gas lasers and plasmatrons, chemical gas reactors, vortex tubes, gas-acoustic and other systems, as well as a system of close stars. In the case of the same name ideal gas in the system the maximum ratio of energy conversion effectiveness is linked to the Carnot theorem, which in its turn is connected with the Nernst theorem. However, numerical analyses show that the class of flow energy systems is non-carnot one. The ratio of energy conversion effectiveness depends on the properties of the working body; a conventional cycle in open-circuit is essentially irreversible. The proved theorem gives a more strongly worded II law of thermodynamics for the selected class of flow energy systems. Implications for astrophysical thermodynamic systems and the theory of a strong shock wave are discussed.

Web link: ***www.IntellectualArchive.com/getfile.php?file=01Y6JOLPopO&orig_file=V_Volov__Energy_Transformation_Limit_Theorem.pdf***

ID #: 409 **Natural Sciences / Physics / Relativity**

Submitted on: May 31, 2012

Author: Mohammad Shafiq Khan

Title: **On the Electrodynamics of Moving Bodies By Albert Einstein is Based on Trickeries**

Abstract: The article "On the Electrodynamics of Moving Bodies" by Albert Einstein (1905) is based on trickeries. The Voigt transformation was simply a mathematical possibility which was changed by Lorentz by introducing the Lorentz factor but the Lorentz factor is not real; has been shown in the article Mohammad Shafiq Khan (2012). Thus nature and forces in nature were trivialized and made subservient to mathematics in the theories of relativity, Big Bang Theory, Space-time concept and in all physical sciences which are directly or indirectly based on the "On the Electrodynamics of Moving Bodies". It is unfortunate for humanity that exposing these trickeries took more than one hundred years.

Web link: ***www.IntellectualArchive.com/getfile.php?file=Qt6gJ0vaxoU&orig_file=Published Version of the article 'On The Electrodynamics of'.pdf***

End of May 2012 bulletin