 1. Project Title - a descriptive title to indicate the nature of your request (limited to 150 char-s).

Introduction to the true fundamental field theory with one extra dimension and emerging 4D-phenomenology of topological quanta (as non-local objects)

 2. Executive Summary - an overview of your project's purpose, activities, and projected outputs and outcomes (limited to 1,300 characters). The summary should highlight the strategic problem or opportunity you intend to address, the main activities of your proposed project, including any innovative approaches, and the anticipated concrete outputs and outcomes.

There's the unique variant of frame field theory (or Absolute Parallelism) which is both beautiful (according to the Principle of Petit Prince: true beauty should be unique) and simple (according to Kolmogorov's theory of complexity of algorithms) - it has no free parameters, and nothing (even D; D=5) can be changed if to keep theory safe from appearance of singularities in solutions of general position. Frame field configurations can carry integer information - topological charge and/or quasi-charge – for symmetrical configurations.
The project should explore the emerging phenomenology of 'topological quanta' and demonstrate with all possible clarity that this can look, at some conditions and to a certain extent, as a 4D quantum field theory on a classical background (with a modified gravity Lagrangian).
In this wise, realistic but non-local along the extra-dimension, one can explain most of the Standard Model. Moreover, a few predictions are possible: the absence of spin zero elementary quanta (quasi-charge group of $SO_3$ symmetry is trivial); neutrinos are true neutral.
The planned participation in conferences, as a part of project's activity, should attract attention of specialists, in particle physics and cosmology, enabling careful verification of this theory.

 3. Project Description - an opportunity to describe you project in narrative form and in enough detail to show its merits (limited to 4,000 characters).

There are two opinions about the fundamental theory, which would describe our entire world. The first one says this theory should be simple and beautiful; the only problem is to know what does it mean to be "simple and beautiful" (great symmetry?). The other opinion is just opposite, but this project prefers the first. If this is the case (the first is true), any really intellectual being

must know this theory (perhaps, our self-naming, 'homo sapience sapience', is given a bit in advance), and the ascertainment of this theory is a true big question.

The main theories of modern physics, General Relativity (as the leading gravity theory) and Standard Model (as the particle theory), are mutually disjoint, incompatible; they have different symmetries and mutually restricted areas of responsibility.

Absolute Parallelism (AP), the theory of a single field (irreducibility) suggested by Einstein, unites the symmetries of Special and General Relativity, so the frame field, $h^a{}_\mu$, has indices of two kinds. Global Lorentz covariance defines the spacetime signature (global feature), while general covariance (local) is of practical importance as the means to rearrange the gradient catastrophe problem.

The formal integrability (compatibility) test can be extended to the cases of degeneration of co-frame matrix (co-singularities), and contra-variant frame density (of some weight). This gives a local, covariant test for singularities; it singles out the unique equation (system) with unique D, D=5 (arXiv:0812.1344v2; D=4 forbidden), which is free of singularities of solutions.

To find a good equation is just the beginning: understanding of its solutions is much more difficult (and endless) process. (Even children can learn the chess rules, but the analysis of chess games, chess 'solutions', needs more experienced people, kinda grand masters.)

In linearity, there are 15 polarizations [D(D-2) in general]; three of them (electromagnetic-like, f-waves) cause linear growth of three other polarizations, so the trivial solution is linearly unstable (but Riemannian curvature does not grow, stable). There is also the longitudinal polarization, and $SO_4$-symmetrical expanding solutions, delivering an example of such an L-wave, can serve as expanding cosmological background, 'wave-guide' for other polarizations, f-waves first of all. If f-amplitudes decrease as $1/t^{0.5}$ (reddening of thermalized ensemble), unstable waves grow as $t^{0.5}$; so the nonlinear terms should be accounted for. This is the issue of the project.

Non-linear spatially localized field configuration can carry digital information - topological charges and quasi-charges, and the emerging phenomenology of 'topological quanta' on the cosmological expanding background (S3-spherical shell, of thickness L, filled with waves giving non-linear field fluctuations) is the main issue of the project.

The 4-th order prolongation of the symmetric part of the system can be written as a modified (RG) gravity equation with EM-like energy-momentum tensor: energy is positive and only f-waves (they move alone usual Riemannian geodesics) contribute in it. This prolonged equation also follows from the least action principle: the Lagrangian is quadratic in symmetrical part (and its trace part) and hence is trivial (as well as its Noether currents). After an exclusion of covariant divergences, the 'quadratic' terms of Lagrangian obtain a nice form: gravity plus EM-like, i.e., RG + $f^2$ (Ricci tensor times Einstein tensor; f-component has no gradient invariance).

Tangible waves moves almost tangentially to the central 3-sphere of L-wave to be trapped inside it; this feature can potentially explain the principle of superposition for secondary, proxy 4D fields aiming to describe how topological quanta (extended along L-size; their parts move along different paths, in agreement with math of quantum theory) scatter f-waves and contribute to $f^2$-term, leading to derived 4D Lagrangian (and what about gravity?).

 4. Strategic Promise - why the project is important or vital and how, if funded and implemented, it would make a difference (limited to 1,000 characters).

At present, at least two diverse "interpretations" of quantum mechanics, Copenhagen and Many-World, have a significant number of followers among physicists and educated people. This (a kinda surplace) means that both approaches are not so convincing. Some people (Feynman, Gell-Mann) uttered an opinion that nobody understand quantum theory; however, the prevailing view seems being that it is Einstein who had not understood quantum mechanics.
This project suggests and advocates a new (or the first) "understanding" of quantum theory - as an emergent phenomenology of topological quasi-particles (quanta); its implementation should support realization of the experiment with single photon interference proposed in arXiv: gr-qc/0610076 (it is aimed at probing photon's full separability).
The project leads also to a modified gravity theory, where the description of gravitational waves (GW) should be quite different; it may turn out that generation of short-wave GW is strongly attenuated.

 5. Capacity for Success - why the applicant, project team, and/or the organization(s) making the request will be able to carry out the proposed project with distinction and high standard of excellence (limited to 1,000 characters).

The suggested theory is just excellent itself. Nevertheless, I am trying to improve my communication skills, as well as my English (following the method of shestov.org).
I have already participated in PIRT-07 and PIRT-09 conferences (Physical Interpretation of Relativity Theory) with oral presentations and in DoG-07 (Dynamics of Galaxies; in a distant form) with poster one.
I am going to improve my exposition of the theory through discussions with my colleagues at the Novosibirsk University (sub-faculty of Quantum Optics, ...; ...), as well as with some students.
My hope to obtain new results, say, derivation of differential forms of topological charges and $SO_2$-symmetrical quasi-charges for D=5, is based on my previous results and accomplishments

(the same problems are already solved for the case D=4: arXiv: gr-qc/0610076; see also my web-page: zhogin.narod.ru).

I would be glad if some co-investigator or PHD student to join this project on some stage.

 6. Expected Outputs - list and describe the work you intend to produce during this project, including conferences, lectures, research papers, manuscripts, training sessions, curricula, etc. Be as specific as possible, quantify each output, and feel free to use bullet points (limited to 1,000 characters).

- To solve a few problems: differential forms of 5D topological quasi-charges; dynamics of tangible and intangible ('growing' and 'not-growing') polarizations in the cosmological wave; features of derivative 4D Lagrangian of topological quanta; description of gravitational waves
- Participation in conferences including the following (and their continuations): Quantum field theory and gravity (qftg2010.tspu.edu.ru); Paris Cosmology Colloquium (chalonge.obspm.fr); GR-20 or ERE2011 (Spanish relativity meeting)
- Two or three arXiv-preprints (or/and papers) on the emergent phenomenology of topological quanta in the expanding cosmological background (single Longitudinal wave)
- A series of introductory lectures on Absolute Parallelism and its physical applications for students and faculty members of NSU
- To convince a team of experimentalists to perform the single photon experiment proposed in the preprint arXiv:gr-qc/0610076
- To interest some theorists in working on this theory

 7. Expected outcomes - list and describe the realistic differences your project would make in your field and in the wider culture. Be as specific as possible, quantify each outcome, and feel free to use bullet points (limited to 1,000 characters).

They say string theory predicts gravity (and supersymmetry) as there's a spin two particle, graviton. In a similar sense the proposed theory predicts quantum field theory (as a phenomenology) and classical (modified) gravity. In other words, "quantum gravity" is just an oxymoron. This result saves time for something other than quantization of gravity.

The theory leads to a simple cosmological model (ultra-relativistic expanding 3-sphere shell) which is a 5D generalization, or FRW-antipode, of the Milne model (empty model): the same scale factor, $a \sim t$, but opposite curvature, $k=+1$ ($k=-1$ in the Milne model). Anti-Milne model

seems to describe GRB-data (gamma-ray bursts), Hubble plot at high z, better than the standard cosmology (arxiv:0902.4513).

Further predictions are possible for color sector: perhaps, the color particles repeat with doubling ('up' and 'down') the combinatorics of 'white' elementary particles; so, color analogs of neutrinos, or electrically neutral quarks can exist

8. Request Amount - ...

9. Total Project Amount - ....

10. Additional Funding from other Sources - briefly list and describe any additional funding sources for the project. If your request amount is equal to the total project budget, this field should be left blank. The Foundation favors projects that have leveraged additional funding from other sources.... (limited to 1,000 characters).

I am going to apply for travel grants from Russian Foundation for Basic Research (RFBR); this requires the commandment to the conference from the organization of work (or by-work, I think). I have no experience of successful grants, so at the moment I am not able to give estimation of additional funding.

11. Project Start Date - ....
12. Project End Date - ....

13. Relation to Sir John Templeton's Donor Intent - briefly describe how your project aligns with Sir John Templeton's Donor Intent (limited to 1,000 characters). We strongly recommend that, before answering this question, you read about Sit John's Philanthropic Vision and the Foundation's Core Funding Areas and 2010 Funding Priorities under What We Fund.

The linear instability of the trivial solution (it's not rare feature; arxiv: 0812.1344) gives a fresh, unexpected answer to the long-standing question: "Why is there something rather than nothing?" (They name Leibnitz, Grunbaum, and even Parmenides.)
In a more mathematical saying: "Why are we so lucky that our "solution" is so far from the trivial one, from 'nothing'? All solutions (initial data) are on equal footing, are not they?" The answer is: "Nothing is just unstable".

The huge extra dimension is also of huge importance (it's well simpler than 6-7 extra dimensions of string theory). This also means that our 4D-looking Universe is not absolutely closed system: this changes radically the problem of "very low initial entropy", or "fine tuning". Information carried by topological quanta is only tiny fraction of information engraved in the ensemble of intangible, growing waves ('growing' also implies an 'arrow of time', a kind of 'spontaneous breaking' of time reversibility).

 Section 2: Personnel Information

 ...

History with the Foundation*:
Please provide information about how you or any member of your team came to learn about the Foundation. Have you previously received funding from the Foundation? Have you participated in any Foundation-sponsored event? Have you discussed your proposed project with anyone at the Foundation? Please limit your response to 1,000 characters.

I have came to learn about the Foundation through reading some blogs (..., ..., and so on). I have never received funding from the Foundation (or other foundations) for my work on the subject of the project.

I did not discuss my proposed project with somebody at the Foundation.