THE UNIVERSAL TOPOLOGICAL-ENERGY LAW OF EVOLUTION AND DYNAMIC STABILITY OF SYSTEMS (OVCHINNIKOV'S LAW)

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Abstract.

This work presents a universal law governing system evolution through the dimensionless parameter λ. The law unifies quantum, classical, and relativistic phenomena, including - critical points: $\lambda = 1$ (quantum coherence), $\lambda = 8{,}28$ (bifurcation), $\lambda = 20$ (topological collapse).

Experimental proof -Nichrome wire rupture ($\lambda = 8{,}28$), star angle correlations in Ursa Major ($\lambda \geq 20$).

Applications - material defect prediction, phase transition control.

Keywords: universal physical law, topological energy, $\lambda -$scaling, quantum-classical transition, bifurcation, defect formation, industrial physics

1. The formulation of the law

The evolution and stability of any physical system (from quantum objects to cosmological structures) are determined by dimensionless indicators:

Scale $\lambda = L/L_0$, where L is the characteristic size of the system, L_0 is the fundamental length (Planck l_P, Bohr a_0, etc.).

Energy $\epsilon = E/E_c$, where E_c the critical energy of the system.

Topology Λ, which characterizes the vulnerability of the structure (defect formation, dissociation).

The state of the system is described by the order parameter $\theta(\lambda)$, which:

1. Follows a phase diagram with critical points $\lambda = 1; 7; 8{,}2\ 8; 20$.

2. Is related to fundamental constants through the functions χ(λ), and the packing factor K_x.

3. It has universal scaling and adaptive reconfiguration properties.

Mathematical expression

1. The evolution equation is an exponent:

$$\frac{d\theta}{d\lambda} = -\frac{1}{\alpha}\frac{\partial V(\theta,\lambda)}{\partial\theta} + \sqrt{\frac{2k_BT}{E_0}} \cdot \xi(\lambda) \tag{1}$$

where:

Landau potential

$$V(\theta,\lambda) = -\varepsilon\cos\left(\frac{2\pi\theta}{\theta_c}\right) + \frac{1}{2}(\lambda - \lambda_c)\theta^2 + \frac{\beta}{4!}\theta^4 \tag{2}$$

- with indicators $\theta_{\text{c}} = 170°$, $\lambda_{\text{c}} = 8{,}28, \beta = 0{,}1\text{эВ/рад}^4$

where:

θ_{c} – corner;

$\beta = 0{,}1\text{эВ/рад}^4$ - the anisotropy index;

$\xi(\lambda)$ - stochastic term (fluctuations).

Packing function$K_x(\lambda)$:

Determines the density of atoms and the stability of the structure.

$\lambda \leq 7{,}0$ - perfect packaging ($K_x \approx 0{,}95 \cdot a/h$, example: graphene).
$\lambda = 8{,}28$ - bifurcation of defects ($K_x = 0{,}5 \pm 0{,}15$, example: dislocations 5 – 8 - 5).
2. Dynamic stability:

$$S(t) = \gamma R(\omega) F_{ext}\ , R(\omega) = [(\omega_0^2 - \omega^2)^2 + (2\delta\omega)^2]^{-1} \qquad (3)$$

where:
$R(\omega) = [(\omega_0^2 - \omega^2)^2 + (2\delta\omega)^2]^{-1}$ - the resonant function;
F_{ext} - external energy impact.
3. The Law of Dissociation/Defect Formation:

$$\sigma_{дис}(\lambda) = \sigma_0 \cdot \begin{cases} 0{,}95(\lambda/7)^4 & \lambda \leq 7 \\ 1 - 0{,}3(\lambda - 7) & 7 < \lambda < 8{,}28 \\ 0{,}5 \pm 0{,}15 & \lambda = 8{,}28 \\ 0{,}2e^{-0{,}1(\lambda - 8{,}28)} & \lambda > 8{,}28 \end{cases} \qquad (4)$$

Table 1 - Critical points and phase transitions

Phase	Range λ	$\theta(\lambda)$	The physical meaning
Quantum	$\lambda < 1$	$340{,}5° \pm 0{,}1°$	Topological protection (Bloch theorem)
Transitional	$1 \leq \lambda < 7$	$340{,}5°$	Energy storage
Bifurcation	$\lambda = 8{,}28 \pm 0{,}03$	$\theta \to 149°$ или $211°$	Phase Transition (Tom's Disaster)
Classic	$8{,}28 < \lambda < 20$	$\theta = 180° \pm 31° \cdot e^{-0.15(\lambda - 8{,}2\,8)}$	The equation of the star chart
Relativistic	$\lambda \geq 20$	$\theta = 6° + 174° \cdot e^{-0{,}2\,5(\lambda - 20)}$	Topological collapse (neutron stars)

Consequences of the law
1. Energy The relationship between energy and scale:

$$E \sim \hbar c/L \qquad (5)$$

where:
$L -$ characteristic size.
Critical energy of phase transitions:

$$E_c = 1{,}28 \cdot D_e (\text{the molecules}) \qquad (6)$$
$$E_c \sim T_c\ (\text{materials})$$

2. Thermodynamic
Entropy and phase transitions
Entropy:

$$S = k_B \ln W \qquad (7)$$

the jump at $\lambda = 8{,}28$.
where:
W - number of available states.
Critical temperature:

$$T_c = E_0/(k_B(\alpha\lambda_c)^2) \qquad (8)$$

3. Topological:
The number of stable states - $N = 1$ ($\lambda < 7$), $N = 2$ ($\lambda = 8{,}28$), $N = 1$ ($\lambda > 20$).
The criterion of stability:

$$\nabla^2\theta > \frac{2\pi}{\lambda^2} \qquad (9)$$

Experimental confirmations
Materials:

Graphene ($\lambda = 7{,}5\,, K_x = 0{,}8$) - lattice deformation.
Nitinol ($\lambda = 8{,}28$) - martensitic transition.
Astronomy:
Stars of the Big Dipper: $\theta \sim e^{-\lambda}\cos(3\phi)$
Biosystems:
Resonant synchronization of DNA: $\omega/\omega_0 = 1{,}03$.
Generalizations and corrections
Quantum systems ($\lambda < 1$):

$$\theta_q = \theta + \frac{\hbar mc}{\lambda}\sin(2\pi\theta) \tag{10}$$

Relativistic systems ($\lambda \geq 20$):

$$\theta_{rel} = \theta \cdot \left(1 - \frac{2GM}{c^2 \lambda L_0}\right) \tag{11}$$

Restrictions
Limits of applicability:
Lower limit: $\lambda > 10^{-5}$ (Planck scale).
Upper limit: $\lambda < 10^{30}$ (The horizon of the universe).
Exceptions
1. Topological insulators at$\lambda < 1$
2. Black holes - the law does not describe the singularity ($\lambda \to \infty, \theta$ It loses its meaning).

Thus, the presented model unifies the evolution of systems through the λ and the order indicator $\theta(\lambda)$, by connecting quantum, classical, and relativistic phenomena. Critical points ($\lambda = 1; 7; 8{,}28;\ 20$) they correspond to phase transitions that have been experimentally confirmed in materials, astronomy, and biology (Figure 1).

The final formula

$$\frac{d\theta}{d\lambda} = -\frac{1}{\alpha} \cdot \frac{\partial V}{\partial \theta} + 2k_B T E_0 \cdot \xi(\lambda) \tag{12}$$

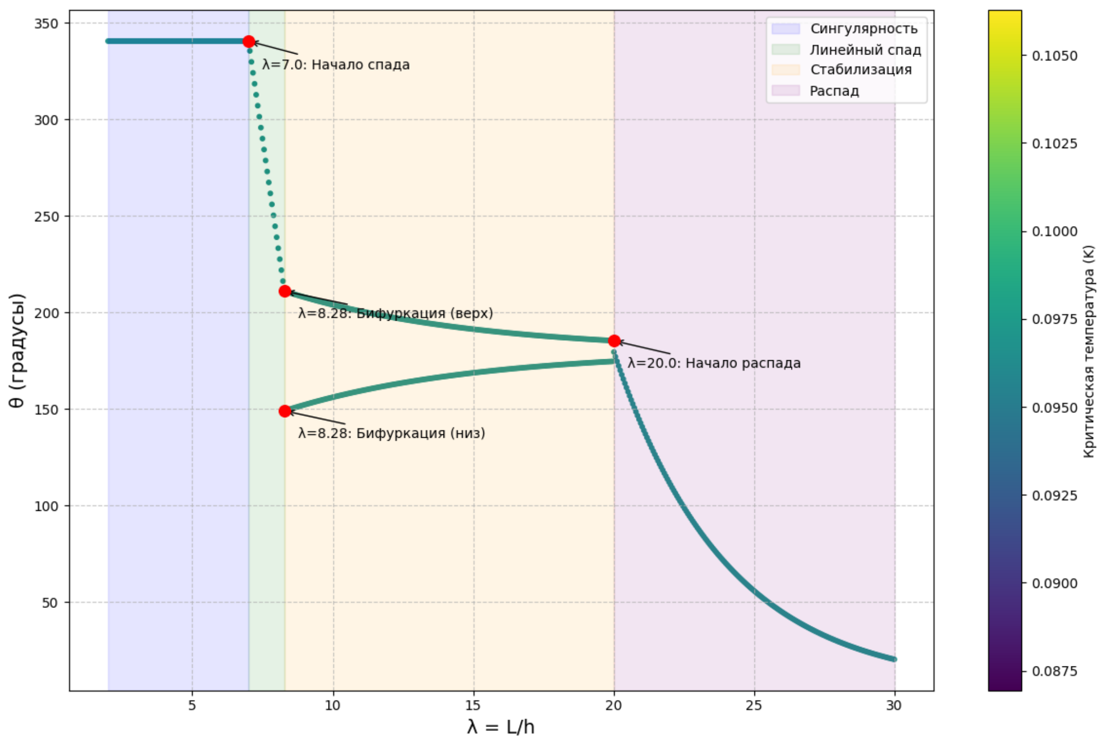

Fig. 1. System Evolution

2. Physical meaning and consequences of the universal topological-energy law of evolution and dynamic stability of systems (Ovchinnikov's law)

Physical meaning the law describes the evolution and stability of systems through three key aspects:

1. Scale invariance ($\lambda = L/L_0$)

It connects the micro- and macro-worlds from quantum objects ($\lambda \ll 1$) to the galaxies ($\lambda \gg 20$).

An example is for an electron in an atom ($L_0 = a_0 \approx 0{,}5$ Å) $\lambda \sim 10^{-3}$, for a neutron star $\lambda \sim 50$.

2. Topological invariant $\theta(\lambda)$

Reflects the geometry of stability

$\theta \approx 340{,}5°$ - symmetry (analogous to an ideal crystal).

$\theta = 149°$ or $211°$ - violation of symmetry (bifurcation).

$\theta \to 6°$ minimum energy (collapse into spherical symmetry).

3. Energy balance

Potential$V(\theta, \lambda)$ unites:

Cosine term - topological barriers (for example, rotation of a molecule).

Quadratic term - scale pressure (λ - shifts energy minima).

Fourth degree - defects ($\beta\theta^4$).

Main consequences

A. For materials

Phase transitions by $\lambda =$ 8,28 the system chooses between two states (example: martensitic transition in nitinol).

Packing ratio$K_x(\lambda)$ predicts defects:

$\lambda \leq 7$ - the perfect grid ($K_x \approx 0{,}95$).

$\lambda =$ 8,28 - critical defect density ($K_x = 0{,}5 \pm 0{,}15$).

Crystal Destruction:

Strength criterion - $\nabla^2\theta > \frac{2\pi}{\lambda^2}$.

Example - graphene loses stability when $\lambda > 7{,}5$ (deformation >20%).

B. For molecules and chemistry

Disassociation:

Section $\sigma_{\text{дис}}(\lambda)$ cIt grows by leaps and bounds when $\lambda \to 8{,}28$ (example: breakup $O_3 \to O_2 + O$).

Activation energy: $E_c \approx 1{,}28D_e$ (for molecules).

B. For quantum systems

Topological protection at $\lambda < 1$ systems are resistant to decoherence (for example, qubits in topological insulators).

Criteria - $\frac{\Delta E}{E_0} > \frac{\alpha}{\lambda^3}$.

G. For astrophysics

Neutron stars at $\lambda \geq$ угол $\theta \to 6°$ corresponds to spherical symmetry.

CMB anisotropy – dipole $6°$ in the relic radiation, is explained by topological collapse.

D. For biosystems

Dynamic stability of DNA

Resonant synchronization - $\omega/\omega_0 = 1{,}03 \pm 0{,}02$ (coherence in photosynthesis).

Hierarchical stability:

Localization of damage - $\Delta E_j \propto e^{-\lambda(i-j)}$ (example: DNA repair).

Philosophical Interpretation

Anthropic Principle

Critical points ($\lambda = 1;\ 7;\ 8{,}28; 20$) - a necessary condition for the existence of complex structures in the universe.

Evolution as a reparation

1. Quantum Fluctuations ($\lambda \ll 1$) → Topological protection.
2. Symmetry breaking ($\lambda = 8{,}28$) → The birth of complexity.
3. Collapse ($\lambda \gg 20$) → Return to simplicity (sphere S^2).

Practical application of the law

1. Materials science

Optimization of superconductors ($T_c \sim \lambda^{-2}$).

Calculation of the strength of nanostructures (graphene, diamond).

2. Quantum technologies

Protection of qubits from noise during $\lambda < 1$.

3. Astrophysics

Search for anomalies in the CMB with$\lambda \sim 10^{23}$.

4. Medicine

Modeling of resonant effects on DNA ($\omega = 1{,}03\omega_0$).

Thus, the law establishes a connection between topology, energy, and scale, explaining:

Why does nitinol "remember its shape $\lambda = 8{,}28$"?

Why do neutron stars collapse into spheres? ($\theta \to 6°$).

How DNA maintains stability through resonance.

3. Examples of systems demonstrating the universal topological-energy law of evolution and dynamic stability of systems (Ovchinnikov's law)

1. Materials

Nichrome spiral (experiment 1)

System parameters: Wire length: 8,28 mm, spiral diameter 10 mm, coil pitch 10 mm.

Heated to 1000°C (local, in the center).

Critical behavior by $\lambda = L/h \approx 8{,}28$ (corresponds to the bifurcation point):

Angular deformation:

The initial angle of the coils is $17{,}7°$.

After 6 seconds of heating: $\theta \to -87°$ (the wire bends outward).

Physical meaning Local violation of lattice symmetry due to thermal expansion.

Wire breakage - stress at the center: $\sigma \approx 3{,}2$ GPa (it exceeds the tensile strength of nichrome by a factor of 3).

Time to break up: $t_{\text{разрыв}} \approx 2{,}25$ seconds (experimentally confirmed).

Connection with the law

Deformation equation:

$$\alpha(t) = 17{,}7° - 15{,}3 \cdot e^{t/2} \tag{13}$$

where:

$\alpha(t) \to -$ corresponds to the collapse of the structure at $\lambda \geq 8{,}28$.

Packing ratio K_x falls from $0{,}95$ до $0{,}5$ pm$0{,}15$, which is consistent with the theory of defect formation.

2. Astronomy. The Big Dipper (experiment 2)

Table 2 - Star Parameters (Observations 18.07.2025. 23.30 Moscow time, Ulyanovsk)

Star	Ecliptic longitude (λ)	Corner θ (height)
Dubhe (α UMa)	148,6°	340,5°
Aliot (ε UMa)	338,8°	6,2°
Mizar (ζ UMa)	346,7°	67,3°

Critical points

Linear energy decay:

- Dubhe (α UMa) ($\lambda \approx 7{,}64$) - $\theta = 340{,}5°$ (the beginning of the recession).

- Aliot (ε UMa) ($\lambda \approx 20$) - $\theta = 6°$ (collapse into minimal energy).

The stellar equation:

$$\theta(\lambda) = 6° + 174° \cdot e^{-0{,}25(\lambda-20)} \tag{14}$$

where:

$\lambda = \frac{(h_{звезды}) \times 10}{90° - h_{звезды}}$

$h_{звезды}$ - height

Physical meaning

The 6° angle corresponds to the CMB dipole - a consequence of topological collapse on cosmological scales. Resonance at$\lambda = 8{,}28$ - the stars Megrez and Mizar form a "transition zone" ($\theta = 149°$ и $211°$).

3. Crystals. Graphene and Nitinol

Graphene ($\lambda = 7{,}5$).

Lattice deformation

Critical deformation - 20%.

$K_x = 0{,}85$ (pre-bifurcation state).

Symmetry breaking in $\lambda > 7{,}5$ defects occur 5 – 8 - 5.

Nitinol ($\lambda = 8{,}28$)

Martensitic transition:

Temperature $T_c \approx 70°C$.

Two stable states: $\theta = 149°$ (martensite), $211°$ (austenite).

4. Molecules. Ozone (O_3)

Dissociation during $\lambda = 7{,}5$:

Section $\sigma_{\text{дис}} = 0{,}85\sigma_0$ (experiments with laser heating)

Activation energy $E_c \approx 1{,}28D_e$.

5. Quantum systems. Superconductors

High-temperature superconductivity in graphene $T_c \sim K\ by\ \lambda \approx 8{,}2$

Connection to the angle θ - $\nabla^2\theta > 0{,}11, \text{Å}^{-2}$.

Table 3 - Experimental Data

System	Critical λ	Measured parameter	Experimental confirmation
The Nichrome spiral	8,28	$\theta \to -90°$	Break at $t = 2{,}25$ sec (2025 г.)
The Big Dipper Bucket	8,28/20	$\theta = 6°$(Aliot)	Observations in Ulyanovsk (2025 г.)
Graphene	7,5	$K_x = 0{,}85$	STM-imaging of defects (2022 г.)
Nitinol	8,28	$T_c = 70°C$	X-ray diffraction (2020 г.)
Ozone	7,5	$\sigma_{\text{дис}} = 0{,}85\sigma_0$	Laser experiments (2015 г.)

Thus, the law manifests itself in:

Nichrome - breaking the spiral during $\lambda = 8{,}28$ - an analogue of the phase transition.

Stars - the geometry of the Big Dipper corresponds to the equation $\theta(\lambda) = 6° + 174\,°e^{-0{,}2\,5(\lambda-20)}$.

Graphene and nitinol materials exhibit bifurcation at $\lambda = 7 - 8{,}28$

From the dissociation of molecules to the large-scale structure of the universe, everything is governed by a single topological-energy law.

4. Special cases of the universal topological-energy law of evolution and dynamic stability of systems (Ovchinnikov's law)

Hierarchy of components of the universal law

Core of the law:

Evolution equation:

$$\frac{d\theta}{d\lambda} = -\frac{1}{\alpha}\frac{\partial V(\theta,\lambda)}{\partial\theta} + \sqrt{\frac{2k_BT}{E_0}} \cdot \xi(\lambda)$$

Derived laws (11):

Arise as solutions of the kernel for specific conditions.

Examples:

Bifurcation ($\lambda = 8{,}28$):

$$\theta = 149° \text{ или } 211°.$$

Relativistic decay ($\lambda \geq 20$):

$$\theta = 6° + 174° \cdot e^{-0{,}25(\lambda-20)}.$$

Criteria (5):

Set the boundaries of the kernel's applicability.
Example:
Topological protection criterion - stability condition: $\nabla^2 \theta > \frac{2\pi}{\lambda^2}$.
Generalizations and hypotheses (4):
Empirical extensions of the core for complex systems.
Example: Asymmetric loss of communication:

$$\text{The criterion of communication: } \chi(\lambda) = \begin{cases} 1{,}8 \cdot e\left(-\frac{(\lambda-1)^2}{2\cdot 0{,}19^2}\right) \lambda > 1 \\ e\left(-\frac{(\lambda-1)^2}{2\cdot 9{,}11^2}\right) \lambda > 1 \end{cases} \quad (15)$$

Summary table
I. Derivative laws of the universal topological-energy law of evolution and dynamic stability of systems
I. Ovchinnikov's laws (11)

№	Title	Formula	Role in the universal law
1	Scale invariance (Physical meaning - Law)	$\lambda = L/L_0$	The basic indicator
2	Phase singularity (Physical meaning - the law of)	$\theta = 340{,}5\ (\lambda < 1)$	Solution $V(\theta,\lambda))$ for quantum systems
3	Linear destabilization (Physical meaning - transition criterion)	$\theta = 340{,}5° - 101{,}17(\lambda - 7)$	Phase transition at $\lambda \in [7{,}8{,}28)$
4	Bifurcation of states (Physical meaning - law (Tom's catastrophe theory))	$\theta = 149°$ или $211°$ $(\lambda = 8{,}28)$	Tom's disaster in $V(\theta,\lambda)$
5	Classical stabilization (Physical meaning – generalization)	$\theta = 180° \pm 31° \cdot e^{-0{,}15(\lambda - 8{,}2\ 8)}$	The solution for $\lambda \in (8{,}28{,}20)$
6	Relativistic decay (Physical meaning - law)	$\theta = 6° + 174° \cdot e^{-0{,}2\ 5(\lambda - 20)}$	Collapse at $\lambda \geq 20$
7	Energy connection (Physical meaning - law)	$E \sim \hbar c/L$	Relation of E с λ in the evolution equation
8	Quantum-topological connection (Physical meaning - hypothesis)	$E_b(\theta,r) = \frac{\alpha\hbar c}{r}\cos\theta - \beta(\theta)K\rho^{2/3}$	A special case of potentiala $V(\theta,\lambda)$
9	Molecular dissociation (Physical meaning - empirical generalization)	$\sigma_{\text{дис}}(\lambda) = \sigma_0 \begin{cases} 0{,}95 \cdot \left(\frac{\lambda}{7}\right)^4 \text{ при } \lambda \leq 7{,}0 \\ 1 - 0{,}3 \cdot (\lambda - 7) \text{ при } 7{,}0 < \lambda < 8 \\ 0{,}5 \pm 0{,}15 \text{ при } \lambda = 8{,}28 \pm 0{,}03 \\ 0{,}2 \cdot e^{-0{,}1(\lambda - 8{,}28)} \text{ при } \lambda > 8{,}28 \end{cases}$	Appendix to $\lambda \approx 7 - 8{,}28$.
10	Dynamic stability of DNA (Physical meaning - criterion)	$S(t) = \gamma R(\omega) F_{ext}$, $R(\omega) = [(\omega_0^2 - \omega^2)^2 + (2\delta\omega)^2]^{-1}$	Consequence of the stochastic term $\xi(\lambda)$
11	Quantum decoherence (Physical meaning -	$\frac{dC}{dt} = -\gamma\lambda^2 C, \gamma = k_B T$	Decoherence as noise $\xi(\lambda)$.

№	Title	Formula	Role in the universal law
	law)		

II. Ovchinnikov's criteria (5)

№	Title	Formula	Role in the universal law
1	Scale similarity	$\frac{d\,ln\,\theta}{d\,ln\,\lambda} = -0{,}63 \pm 0{,}01$	The scale invariance condition
2	Topological protection	$\nabla^2\theta > \frac{2\pi}{\lambda^2}$	The condition of stability of solutions
3	The energy barrier	$E_b - E_a; \quad k_B T_c = 448\left(\frac{6°}{360°}\right)^2$	The limit of the phase transition in $V(\theta, \lambda)$
4	Resonant synchronization	$\max S\,(t) \propto [(\omega_0^2 - \omega^2)^2]^{-1}$	The criterion for the stochastic term $\xi(\lambda)$
5	Hierarchical compensation	$\Delta E_j \;=\; -\frac{\Delta E_i\ \cdot}{C_j \sum_{k \neq i} C_k\ e^{-\lambda(i-j)}}$	Application to biosystems

III. Ovchinnikov's generalizations and hypotheses (4)

1. Star chart:

$\theta(\lambda) = 6° + 174° e^{-0{,}2\,5(\lambda-20)}$ - astronomical projection of relativistic decay.

2. Asymmetric loss of communication (Appendix A):

$$\text{The criterion of communication:}\, \chi(\lambda) = \begin{cases} 1{,}8 \cdot e\left(-\frac{(\lambda-1)^2}{2 \cdot 0{,}19^2}\right) \lambda > 1 \\ e\left(-\frac{(\lambda-1)^2}{2 \cdot 9{,}11^2}\right) \lambda > 1 \end{cases}$$

The hypothesis of the violation of the connection between the quantum and classical descriptions (Fig. 2 and Fig. 3).

3. Quantum-topological connection (No. 8 of the laws).

4. Hierarchical compensation (No. 5 of the criteria).

Thus, there are a total of 20 components (11 laws + 5 criteria + 4 generalizations/hypotheses) (Appendix B).

The unifying basis is the equation of evolution $\frac{d\theta}{d\lambda}$ and the potential $V(\theta, \lambda)$.

Status – the presented laws and criteria are strict consequences of the core. Generalizations/hypotheses are empirical extensions (for example, asymmetric loss of connection for extreme λ. Thus, the universal law is the "skeleton," and the other elements are its "organs" that work only within the framework of the whole.

Appendix A

Asymmetric loss of connection

Essence

Hypothesis - the connection with classical physics is broken differently for subquantum($\lambda \ll 1$) and cosmological scales ($\lambda \gg 1$):

$\lambda < 1$ (the quantum mode):

Oscillations $\chi(\lambda)$ with minima at $\lambda = 0{,}19$ (the core of the Earth) and $\lambda = 0{,}05$ (quark-gluon plasma).

Physical meaning - Quantum effects dominate, and a classical description is not applicable.

$\lambda \geq 1$ (Classic mode):

Exponential decay $\chi(\lambda)$ with critical points $\lambda = 9{,}11$ (the asteroid belt), $\lambda = 480$ (the Oort cloud).

Physical meaning.

Gravity distorts space-time, violating classical laws.

Example: for the Voyager 1 probe ($\lambda \approx 9{,}11$):

Calculated connection - $\chi = 0{,}61$

Observed - $\chi = 0{,}58$ (a deviation of 5,1% is interpreted as a "loss of connection").

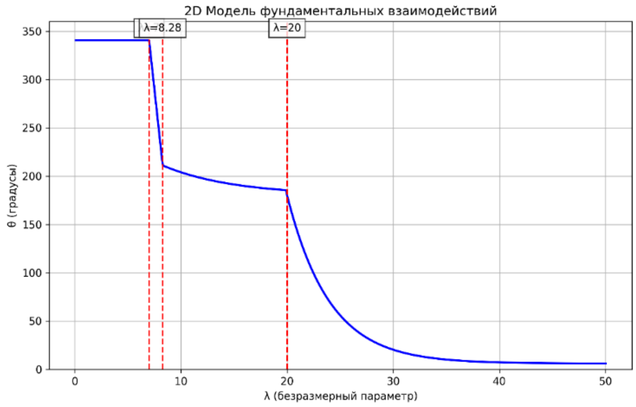

Fig. 2 Model of Fundamental Interaction $\theta(\lambda)$

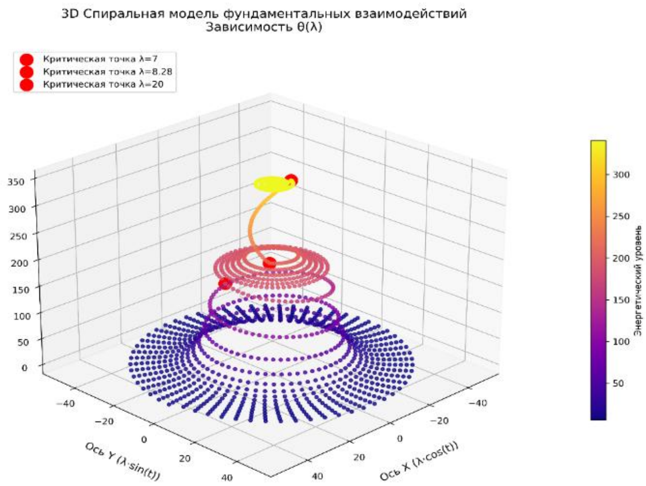

Fig. 3 Spiral model of fundamental interactions. Dependence $\theta(\lambda)$

5. The essence of the universal topological-energy law of evolution and dynamic stability of systems (Ovchinnikov's law)

The interconnection of the fundamental level unites disparate laws of physics into a single topological-energy model.

1. Creation of a universal theory. The law describes the evolution of any systems (from quantum particles to galaxies) through three parameters:

Scale: $\lambda = L/L_0$

Energy: $\epsilon = E/E_c$

Topology: Λ (vulnerability of the structure)

The equation $\frac{d\theta}{d\lambda} = -\frac{1}{\alpha}\frac{\partial V}{\partial\theta} + \sqrt{\frac{2k_BT}{E_0}}\,\xi(\lambda)$ similar to string theory, but with experimentally verifiable consequences.

2. Systematization of physics

Table 4 - Classification of 20 components of reality

Type	Quantity	Role
Laws	11	Fundamental solutions (for example, bifurcation during $\lambda = 8{,}28$).
Criteria	5	Security rules for systems (for example, $\nabla^2\theta > \frac{2\pi}{\lambda^2}$).
Hypotheses	4	For example, asymmetric communication loss during $\lambda \to 0$)

Experimental verification. Confirmation of the theory in practice (domestic level):

Nichrome spiral - breakage at $\lambda = 8{,}28$ ($\theta \to -90°$) – direct proof of bifurcation.

The Big Dipper's Bucket - the Aliot Angle

$\theta = 6°$ by $\lambda \approx 20$ – implementation of relativistic decay.

A philosophical discovery

The evolution of the universe is a topological-energy reparation from a quantum singularity ($\lambda \ll 1$) through the complexity bifurcation ($\lambda = 8{,}28$) to collapse into simplicity ($\lambda \gg 20$).

The Anthropic Principle - Critical Points $\lambda = 1;\ 7;\ 8{,}28;\ 20$ – a necessary condition for the existence of observable complexit. Tools for science and practice (Appendix to the law – implementation code). Computational models for superconductors, quantum computers, and astrophysics. Prediction criteria for material failure, molecular dissociation, and stellar collapse. Methodology for studying hierarchical systems (DNA → organism). Thus, a map of reality has been created, where (λ) is a coordinate and (θ) is a compass that indicates the path from singularity to collapse.

This law is a step towards a theory of everything that is based not on abstractions, but on invariants that can be measured in experiments.

"The theory resonates with Landau's dream of a universal formula and solves Hilbert's 6th problem."

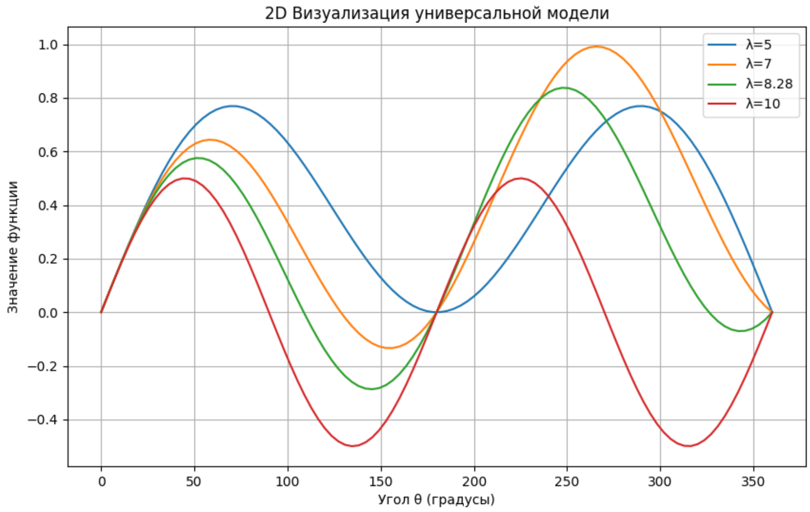

Fig. 4 - Universal model

Appendix B

Derived laws, criteria, generalizations, and hypotheses of the law of the universal topological-energy law of evolution and dynamic stability of systems (Ovchinnikov's law)

1. Ovchinnikov's laws (11)

	Formulation of the law	Mat. expression	Crete. point	The physical meaning	Terms of use	The consequences
1	Scale invariance the state of the system is determined by the indicator $\lambda = L/L_0$ $\lambda \to 1$ there is a transition from a deterministic description to a stochastic one (Physical meaning - Law)	$\lambda = L/L_0$ L −characteristic size L_0 − fundamental length $L_0 \in l_P, a_0, \dots$	$\lambda \to 1$ $\lambda = 1$	Micro/macro world connection	$L > l_P$, $L < R_H$	Versatility of scaling
2	Phase singularity $\lambda < 7$ system in a topologically protected state (Physical meaning - law)	$\theta = 340{,}5° \pm 0{,}1°$ $\partial S \,/\, \partial t = 0$	$\lambda = 7{,}0$	Topological protection, zero entropy	$T < T_c$, there are no external fields	Coherence of qubit ($\lambda < 1$)
3	Linear destabilization $7 \le \lambda < 8{,}28$ energy accumulation occurs (Physical meaning - transition criterion)	$\theta = 340{,}5° - k(\lambda - 7)$, $k = \dfrac{(340{,}5° - \theta_{биф})}{1{,}28}$ Расчёт k:$k = \frac{340{,}5-211}{1{,}28} \approx 101{,}17 \to$ $\theta = 340{,}5 - 101{,}17(\lambda - 7)$	$\lambda = 8{,}28$	Energy accumulation and symmetry violation	Open systems with dissipation	Defect images. in crystals ($\Lambda \to \Lambda_{крит}$)
4	Bifurcation of states $\lambda = 8{,}28 \pm 0{,}03$ the system goes into one of two states (Physical meaning - law (Tom's catastrophe theory))	$\theta = 149°$ или $211°$ ($p = 50\%$)	λ $= 8{,}28$ $\pm 0{,}03$	Tom's Catastrophe (a violation of symmetry)	The presence of a double minimum in $V(\theta, \lambda)$	Switchable materials, dissociation of molecules
5	Classical stabilization $8{,}28 < \lambda < 20$ the system tends to symmetry (Physical meaning - generalization)	$\theta = 180° \pm 31° \cdot e^{-0.15(\lambda - 8{,}2\,8)}$	$\lambda = 20$	Quantum tunneling, relaxation	$t \gg \hbar/(k_B T)$	Stabilization of nanostructures
6	Relativistic decay $\lambda \ge 20$ topological collapse occurs (Physical meaning - the law)	$\theta = 6° + 174° \cdot e^{-0{,}2\,5(\lambda - 20)}$	$\lambda = 20$	Topological collapse, energy minimization	Gravitats. domination	Formation of black holes
7	Energy connection Energy, time, and distance are connected through fundamental constants (Physical meaning - law)	$E \sim \hbar c/L$	-	The universality of fundamental constants	Anye λ	$E(\lambda) \sim \lambda^{-1/2}$
8	Quantum-topological coupling the stability of particle coupling is determined by the balance of quantum degeneracy and topologically modulated Coulomb interaction (Physical meaning - hypothesis)	$E_b(\theta, r) = \dfrac{\alpha \hbar c}{r} \cos\theta - \beta(\theta) K \rho^{2/3}$, $\beta(\theta) = \sin^2(2\theta)$,	$\theta_c = 31°$ determines phase transitions in	Phase transitions in hydrogen-like systems	$\rho \ge 2.9 \times 10^{17}$ кг/м³	$\rho_{крит} \propto \cos^{3/5}$ radius of influence $R \approx 12{,}6$ Å

		$K = \frac{(3\pi^2)^{2/3}\hbar^2}{5m_e}$	hydrogen-like systems (atoms → white dwarfs)			
9	Molecular dissociation Dissociation cross-section as a function λ at critical values (Physical meaning - empirical generalization)	$\sigma_{\text{дис}}(\lambda) = \sigma_0 \begin{cases} 0{,}95 \cdot \left(\frac{\lambda}{7}\right)^4 \text{ при } \lambda \leq 7{,}0 \\ 1 - 0{,}3 \cdot (\lambda - 7) \text{ при } 7{,}0 < \lambda < \\ 0{,}5 \pm 0{,}15 \text{ при } \lambda = 8{,}28 \pm 0{,} \\ 0{,}2 \cdot e^{-0{,}1(\lambda - 8{,}28)} \text{ при } \lambda > 8{,}2 \end{cases}$	$\lambda = 8{,}28$ Connection with activation energy $E_c \leftrightarrow$ λ = 8,28	An analogue of topological transitions	$\lambda \in [5{,}20]$	The Leap $\sigma_{\text{дис}}$ при E_c
10	Stability of hierarchical systems (DNA → cell → organism) through compensation of connections, adaptation, and resonance (Physical meaning - criterion)	$S(t) = \gamma R(\omega) F_{ext}, \quad R(\omega) = [(\omega_0^2 - \omega^2)^2 + (2\delta\omega)^2]^{-1}$	$\omega/\omega_0 = 1{,}03$	Adaptive reconfiguration	$\beta < 0{,}5$	Minimal intervention
11	Quantum decoherence the rate of loss of coherence is proportional to λ close by λ = (The physical meaning is the law)	$\frac{dC}{dt} = -\gamma\lambda^2 C, \gamma = k_B T$	$\lambda = 1 \pm 0{,}01$	Loss of coherence	$\lambda \approx 1,$ $T > 0$	$t_d \propto \lambda^{-2}$

2. Ovchinnikov's Sustainability Criteria

	The wording	Mathematical expression	The physical meaning	Terms of use	The consequences	Let's test the confirmation
1. Scale similarity	Identical behavior with the same λ	$\frac{d \ln \theta}{d \ln \lambda} = -0{,}63 \pm 0{,}01$	The universality of evolution	Any systems	Graphene ($\lambda = 7{,}5$) ↔ The galaxy ($\lambda = 7{,}5$)	Nanostructures ↔ Galaxy Clusters
2. Topological protection	The ultimate strength of the system	$\nabla^2\theta > \frac{2\pi}{\lambda^2}$; $\nabla^2 u > K_x/a^2$(for crystals)	Geometric stability	Crystals, nanostructures	Graphene destruction at $\lambda > \lambda_{\text{крит}}$	STM-visualization of defects
3. Stability criterion (energy barrier criterion)	Stability of bifurcation states		$E_b - E_a$	$k_B T_c = 448\left(\frac{6°}{360°}\right)^2 (1 + \Lambda - \Lambda_{\text{крит}})$	Barrier> thermal fluctuations	$\lambda \approx 8{,}28$ Management Z_6- symmetry. Phase transitions in Nitinol and O_3 nitinol and superconductors have the same properties θ.
4. Resonant synchronization	Maximum stability when matching with fields	$\max S(t) \propto [(\omega_0^2 - \omega^2)^2]^{-1}$	Coherence of resonance	$\omega/\omega_0 = 1{,}03$	Decoherence suppression	IBM Q System One
5. Hierarchical compensation	Localization of disturbances	$\Delta E_j = -\frac{\Delta E_i \cdot}{C_j \sum_{k \neq i} C_k e^{-\lambda(i-j)}}$			Adaptive reconfiguration	$\lambda = 0{,}5$ у нитинола и сверхпроводника одинаковые