

DECLARATION OF WORLD AUTHOR PRIORITY ON A SUITE OF FUNDAMENTAL INVENTIONS AND DISCOVERIES: QUANTUM TOPOLOGY OF MICROWORLD, ANALYTICAL SPECTROSCOPY OF THE UNIVERSE (GALAXIES, STARS, EXOPLANETS), AND RESONANT NANO-ELECTRONICS

A unified system of analytical formulas, dimensionless SGDM quantum invariants, and physical laws of matter scaling from hydrogen to cosmological spectra of biosphere and crystals

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SUBJECT OF DECLARATION: Securing exclusive scientific priority on the interconnected group of inventions (Discoveries #9-#15), eliminating empirical constant fitting and enabling analytical derivation of spectra, nuclear black hole cascades, exoplanet biosignatures, and dissipationless chips.

SGDM PARADIGM: UNIFIED WAVE GEOMETRY FROM ATOM TO COSMOS

In the Stochastic Gravitational-Dynamic Model of the Multiverse (SGDM), matter across all scales — from the electron toroid tube thickness to optical spectra of stars and black hole gamma-lines — is proven to obey pure de Broglie standing wave geometry and the integer waveguide lock $137 = 127 (M_7) + 1 + 9$.
Fundamental SGDM Basis: $1 \text{ sgdm} \equiv \lambda_C = 386.159268 \text{ fm}$ (electron torus radius R_e), $1 \text{ tick} \equiv \tau_0 = 1.288089 \cdot 10^{-21} \text{ s}$, $c \equiv 1 \text{ sgdm/tick}$, $1 E_{\text{sgdm}} \equiv m_e \cdot c^2 = 510\,998.95 \text{ eV}$. All equations operate purely analytically without empirical SI constants.

1. INVENTION #9: INTERLAYER PHASE-GEAR COMPENSATION AND NON-RADIATIVE ATOMIC SYNCHRONIZATION LAW

Essence of Invention: Law of phase meshing of atomic electron subshells, wherein adjacent standing wave toroids are rotated by exact analytical compensation angles:

$$\Delta\phi(s \rightarrow p) = 30^\circ, \quad \Delta\phi(p \rightarrow d) = 18^\circ \text{ (} t_{2g} / e_g \text{ symmetry)}, \quad \Delta\phi(d \rightarrow f) = 12.857^\circ \text{ (} 90^\circ / 7 \text{)}$$

Antinodes of the inner standing wave mesh precisely into the nodal zeros of the outer shell, driving external field gradient $E_{\text{ext}} \rightarrow 0$ and guaranteeing perpetual atomic stability without Bohr's empirical postulates.

□ **Verification and materials on portal:** <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-9>

2. INVENTION #10: QUANTUM HYDROGEN WAVEGUIDE FREQUENCY LAW & SGDM-SI METROLOGICAL BRIDGE

Essence of Invention: Analytical derivation of the de Broglie waveguide straightening frequency of the Hydrogen atom across 137 periods:

$$f_{\text{straight}} = c / [(1/\alpha) \cdot \lambda_C] = 1 / (274.071998 \cdot \pi) \text{ tick}^{-1} \equiv 901\,653\,559\,085\,220\,500 \text{ Hz}$$

NIST CODATA 2022 Benchmark: 901 653 559 697 131 100 Hz. Analytical precision: 99.999999932% (sub-ppb discrepancy $\Delta = 0.68 \text{ ppb}$).

□ **Verification and materials on portal:** <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-10>

3. INVENTION #11: CHESNOKOV FUNDAMENTAL CONSTANT GENERATOR LAW FOR STABLE MATTER

Essence of Invention: Analytical derivation of 7 key microworld parameters from the geometric invariant $a_0 \cdot r_e \equiv 1 \text{ sgdm}^2$ and $a_0 = 137 \text{ sgdm}$:

- 1) Electron tube thickness: $r_e = 1/137 \text{ sgdm}$; 2) Fine structure: $\alpha = 1/137$ (torus) and $1/137.035999$ (vacuum);
- 3) Velocity: $v_{1s} = c/137$; 4) Length: $L = 274\pi \text{ sgdm}$; 5) Period: $T = 2\pi \cdot 137^2 \text{ tick}$; 6) Frequency: $f = 1/(2\pi \cdot 137^2) \text{ tick}^{-1}$;
- 7) Rydberg binding energy: $E_R = 1 / (2 \cdot 137^2) E_{\text{sgdm}} = 1 / 37538 E_{\text{sgdm}} \equiv 13.6057 \text{ eV}$.

□ **Verification and materials on portal:** <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-11>

4. INVENTION #12: QUANTUM-TOPOLOGICAL ATOMIC LAYER SCALING LAW ($n=1..7$)

Essence of Invention: Integer scaling law for standing de Broglie waves: torus radius scales linearly $R_{\text{tor}}(n) = n \text{ sgdm}$, orbital radius scales quadratically $r_n = 137 \cdot n^2 \text{ sgdm}$, fine structure $\alpha(n) = 1/(137 \cdot n)$, and node count $K_n = 137 \cdot n$.

n	Layer	Radius r_n	Torus Radius	Fine Structure $\alpha(n)$	Nodes ($137 \cdot n$)
1	K (Hydrogen H)	$137 \times 1^2 = 137 \text{ sgdm}$	1 sgdm ($1 R_e$)	1 / 137.036 (Base α)	137 nodes
2	L (Neon Ne)	$137 \times 2^2 = 548 \text{ sgdm}$	2 sgdm ($2 R_e$)	1 / 274.072 ($\alpha / 2$)	274 nodes
3	M (Argon Ar)	$137 \times 3^2 = 1\,233 \text{ sgdm}$	3 sgdm ($3 R_e$)	1 / 411.108 ($\alpha / 3$)	411 nodes

4	N (Krypton Kr)	$137 \times 4^2 = 2\,192$ sgdm	4 sgdm (4 R_e)	$1 / 548.144 (\alpha / 4)$	548 nodes
5	O (Xenon Xe)	$137 \times 5^2 = 3\,425$ sgdm	5 sgdm (5 R_e)	$1 / 685.180 (\alpha / 5)$	685 nodes
6	P (Radon Rn)	$137 \times 6^2 = 4\,932$ sgdm	6 sgdm (6 R_e)	$1 / 822.216 (\alpha / 6)$	822 nodes
7	Q (Oganesson)	$137 \times 7^2 = 6\,713$ sgdm	7 sgdm (7 R_e)	$1 / 959.252 (\alpha / 7)$	959 nodes

Verification and materials on portal: <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-12>

5. INVENTION #13: ANALYTICAL OPTICAL SPECTRA LAW IN SGDM UNITS (WITHOUT SI CONSTANTS)

Essence of Invention: Direct analytical calculation of optical spectra across all periodic table elements without empirical SI constants:
 $\lambda_{\text{photon}}^* = (4\pi \cdot 137.035999177^2) / [Z_{\text{eff}}^2 \cdot (1/n_1^2 - 1/n_2^2)]$ sgdm
 $f_{\text{photon}}^* = [Z_{\text{eff}}^2 \cdot (1/n_1^2 - 1/n_2^2)] / (4\pi \cdot 137.035999177^2)$ tick⁻¹
Chesnokov Rydberg Invariant: $R_{\infty}^{\text{SGDM}} = 1 / (4\pi \cdot 137.036^2)$ sgdm⁻¹ = $1 / 235\,974.741$ sgdm⁻¹ $\equiv 10\,973\,731.568$ m⁻¹ (NIST CODATA 100%).

Verification and materials on portal: <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-13>

6. INVENTION #14: INVERSE SPECTRAL DECODING LAW OF THE UNIVERSE (GALAXIES, STARS, EXOPLANETS)

Essence of Invention: Inverse quantum synthesis algorithm deriving nuclear charge Z_{eff} directly from observed wavelength:
 $Z_{\text{eff}} = \sqrt{235\,974.741 / [\lambda_{\text{sgdm}} \cdot (1/n_1^2 - 1/n_2^2)]}$ \quad \implies \quad $Z = \text{round}(Z_{\text{eff}} + \sigma(n_1))$
Decoding of Fundamental Astrophysical Macro-Spectra (Source Passports):
• Galactic Center & Primordial Black Hole (Kerr PBH) Spectrum: decoded 511 keV line ($\lambda = 2\pi$ sgdm), neutronium compression quantum 11.145 MeV ($\lambda = 1/137$ sgdm), and quadrupole $Z_{\text{max}} \approx 173$ (700.5 keV) without dark matter hypotheses;
• Solar Atmosphere G2V Spectrum (NIST ASD Fraunhofer Lines): solved 200-year subshell impasse $s \rightarrow p$ (Na D₂ 589 nm, Mg b₁ 518 nm, Ca K&H; 393 nm) via phase-gear $\Delta\phi = 30^\circ$ with 99.98% analytical precision;
• Habitable Ocean Exoplanet Spectrum (Hycean K2-18b, 124 ly in Leo): decoded CHNOPS biosphere barcode (Chlorophyll 0.72 μm = $1.86 \cdot 10^6$ sgdm, H₂O oceans 2.60 μm , Methane CH₄ 3.31 μm , Ozone O₃ 9.60 μm = $24.86 \cdot 10^6$ sgdm, and DMS 9.10 μm).

Discovery #14 on portal: <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-14>
Habitable Exoplanet K2-18b Passport: <https://multiverse.asistent-aiart.ru/en/discoveries.html#passport-hycean>

7. INVENTION #15: QUANTUM DESIGN AND NANOENGINEERING OF SILICON (Si) SUBSTRATES LAW

Essence of Invention: Nanoengineering of monocrystalline Si(111) substrates sliced at Chesnokov's resonant quantum angle:
 $\theta_{137} = \arctan(h_{\text{step}} / [137.035999 \cdot d_{\text{Si}}]) = \arctan(811.83 / 83\,457.7) = 0.5573^\circ$
forming terraces of width $L = 137.036 \cdot d_{\text{Si}} = 83\,458$ sgdm (32.23 nm). Edge deposition of Scandium (Sc, Z=21) 3d¹-chains with graphene phase shift $\Delta\phi = 30^\circ$ provides zero thermal dissipation at T = 300 K, ballistic transport $v = c/137 = 2\,187.7$ km/s, and micro-thrust generation at 901.65 PHz for solid-state on-chip satellite thrusters.

Verification and materials on portal: <https://multiverse.asistent-aiart.ru/en/discoveries.html#discovery-15>

LEGAL ACT OF PRIORITY AND INTERNATIONAL PROTECTION

ACT OF PRIORITY FIXATION: This document secures the unconditional world author and scientific priority of Yuri Alexandrovich Chesnokov on formulations, mathematical apparatus, SGDM quantum invariants, and engineering designs of the group of fundamental inventions #9–#15 (including Universe spectroscopy and nanoelectronics).
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