

Sergey Victorovich Simonenko

Dr. Sergey Victorovich Simonenko was born in Uglekamensk, U.S.S.R. on 2 July 1959 as the elder son of Victor Leontevich and Tatyana Alekseevna Simonenko. He has two daughters: Tatyana (1987) and Anastasiya (1994). He has graduated the Moscow Physical-Technical Institute, the Faculty of Aerophysics and Cosmic Explorations, the Speciality – Thermodynamics and Aerodynamics, the Specialization – Physics of Oceans. Dr. Simonenko is a Leading Scientist of the V.I. Il'ichev



Pacific Oceanological Institute, Far Eastern Branch of Russian Academy of Sciences. Dr. Simonenko has obtained his student learning from the outstanding Russian scientists: Prof. S.S. Voit (Hydrodynamics), Prof. V.M. Kamenkovich (Fundamentals of ocean dynamics), Prof. G.I. Barenblatt (Dimensional analysis and self-similarity methods in geophysical hydrodynamics), Academician B.V. Raushenbah (Celestial mechanics), Academician S.A. Kristianovich (Thermodynamics and aerodynamics), Academician G.S. Golitsyn (Geophysics), Academician A.S. Monin (Geophysical hydrodynamics), Academician V.S. Vladimirov (Equations of the mathematical physics) and Academician V.A. Akulichev (Acoustics).

Dr. Simonenko has published several articles, monographs, and proceedings of the conferences as author and co-author. As a single author, Dr. Simonenko has published most recently two articles in scientific journals: [1] – “The macroscopic non-equilibrium kinetic energies of a small fluid particle” (Berlin – New York, 2004); [2]

– “Generalization of the classical special formulation of the law of large numbers” (Vladivostok, 2005); the article [3] – “Statistical thermohydrodynamics of irreversible strike-slip-rotational processes” in the collective monograph “Rotational Processes in Geology and Physics” (Moscow, 2007); the textbook (1) – “Non-equilibrium Statistical Thermohydrodynamics, Vol. I. Towards the foundation of the tolerance theory and the theory of dissipative non-equilibrium turbulent chaos,” Vladivostok, 2004; and the following scientific monographs: {1} – “Non-equilibrium Statistical Thermohydrodynamics, Vol. II. Towards the foundation of the theory of the non-equilibrium dissipative small-scale turbulence and the tolerance theory related with the quality control,” Vladivostok, 2005; {2} – “Non-equilibrium Statistical Thermohydrodynamics of Turbulence,” Moscow, 2006; {3} – “Non-equilibrium Statistical Thermohydrodynamics, Foundation of the theory of the small-scale turbulence and the tolerances theory,” Vladivostok, 2006; {4} – “Thermohydrogravodynamics of the Solar System”, Nakhodka, 2007; {5} – “Thermohydrogravodynamic evolution of the planets and the tolerances theory,” Vladivostok, 2008, {6} – “Fundamentals of the Thermohydrogravodynamic Theory of Cosmic Genesis of the Planetary Cataclysms,” Nakhodka, 2009.

He generalized [1] the classical de Groot and Mazur expression $\mathcal{E}_k = \mathcal{E}_t + \mathcal{E}_r$ for the macroscopic kinetic energy per unit mass \mathcal{E}_k in Non-Equilibrium Thermodynamics (de Groot and Mazur, 1962) by founding the generalized expression $\mathcal{E}_k = \mathcal{E}_t + \mathcal{E}_r + \mathcal{E}_s + \mathcal{E}_{s,r}^{\text{coup}} + \mathcal{E}_{\text{res}}$ taking into account (along with the classical macroscopic translational kinetic energy per unit mass \mathcal{E}_t , the classical macroscopic internal rotational kinetic energy per unit mass \mathcal{E}_r and a small correction \mathcal{E}_{res}) a new macroscopic internal shear kinetic energy per unit mass \mathcal{E}_s , which expresses the kinetic energy of macroscopic shear motion and a new

macroscopic internal kinetic energy of a shear–rotational coupling per unit mass $\mathcal{E}_{s,r}$, which expresses the kinetic energy of local coupling between the shear and rotational continuum motions.

Dr. Simonenko generalized [2] the classical formulation (Kolmogorov, 1974; Nicolis and Prigogine, 1989) of the weak law of large numbers by taking into account the coefficients of correlations $\rho(\mathbf{X}_i, \mathbf{X}_k)$ between the different random variables \mathbf{X}_i and \mathbf{X}_k of an infinite sequence of random variables $\mathbf{X}_1, \mathbf{X}_2, \dots, \mathbf{X}_n \dots$ with finite expected value $a = \langle \mathbf{X}_i \rangle < \infty$ and with finite variance σ^2 of the random variables $\mathbf{X}_i, i = 1, 2, \dots$. He established [2] that the sample average $(\mathbf{X}_1 + \mathbf{X}_2 + \dots + \mathbf{X}_n)/n$ converges in probability towards the expected value a for $n \rightarrow \infty$ if $\lim_{n \rightarrow \infty} \frac{\sigma^2}{n} \sum_{i,k=1; i \neq k}^n \rho(\mathbf{x}_i, \mathbf{x}_k) = 0$.

Dr. Simonenko solved the turbulence problem “commonly regarded as the last great unsolved problem of classical physics” (Saffman, 1997) by founding the closure relations ([1], {1}, {2}, {3}) for the three-dimensional isotropic and anisotropic small-scale dissipative turbulence based on the following foundation: 1) the Galilean principle of relativity, 2) the classical concepts of the Euclidean space and the Newtonian time, 3) the model of the Newtonian viscous continuum, 4) the Gibbs and Einstein conception of the statistical ensemble of non-equilibrium dissipative (Prigogine, 1977) subsystems, 5) the synthesis of the classical conceptions (Taylor, 1935; Kármán and Howarth, 1938; Kolmogorov, 1941; Townsend, 1951; Batchelor, 1953) of the stochastic decomposition of the hydrodynamic turbulent velocity field describing by the Taylor series expansions (consistent with the Helmholtz’s theorem) as a random function of deterministic space and random hydrodynamic tensorial variables related with the local velocity shear and internal rotation, 6) the classical and generalized [2] formulations of the weak law of large numbers and 7) the classical de Groot and Mazur macroscopic internal rotational and the established macroscopic non-equilibrium kinetic energies [1]. The realistic quantitative agreement and practical significance of the established closure relations are demonstrated ([1], {1}, {2}, {3}) for the three-dimensional isotropic and anisotropic small-scale laboratory and oceanic stratified turbulence in the wide range of the energy-containing length scales from the inner Kolmogorov length scale (Kolmogorov, 1941) to the length scales proportional to the Ozmidov length scale (Ozmidov, 1965). Based on the

fundamental physical distinction (Planck, 1930; Prigogine, 1977) between the classical "reversible" macroscopic rotational (de Groot and Mazur, 1962) and "irreversible" macroscopic non-equilibrium kinetic energies [1], Dr. Simonenko generalized ({2}, {3}) the classical Gibbs (1873) relation (for the differential ds of entropy per unit mass S of the one-component macrodifferential deformed continuum element with no chemical reactions): $du = Tds - pd\vartheta$ by founding the generalization (for the small macroscopic continuum region τ): $du + d\varepsilon_r - d\varepsilon_s - d\varepsilon_{s,r}^{coup} = Tds - pd\vartheta$ taking into account the total differentials $d\varepsilon_r$, $d\varepsilon_s$ and $d\varepsilon_{s,r}^{coup}$ (following the continuum substance) of the classical macroscopic internal rotational kinetic energy per unit mass ε_r (de Groot and Mazur, 1962), the macroscopic internal shear kinetic energy per unit mass ε_s [1] and the macroscopic internal kinetic energy of a shear-rotational coupling per unit mass $\varepsilon_{s,r}^{coup}$ [1]. Based on the established generalization of the classical Gibbs (1873) relation, Dr. Simonenko generalized the classical (de Groot and Mazur, 1962) expression (for the entropy production per unit time in the one-component macro-differential deformed continuum element with no chemical reactions):

$$\frac{ds}{dt} = \frac{1}{T} \frac{dq}{dt} - \frac{1}{T} \vartheta \Pi : \text{Grad } \mathbf{v}$$

(deduced in accordance with the classical Boltzmann's approach identifying the increase of entropy with the increased molecular disorder) by founding {3} the generalized expression:

$$\frac{ds}{dt} = \frac{1}{T} \frac{dq}{dt} - \frac{1}{T} \vartheta \Pi : \text{Grad } \mathbf{v} + \frac{1}{T} \frac{d\varepsilon_r}{dt} - \frac{1}{T} \frac{d\varepsilon_s}{dt} - \frac{1}{T} \frac{d\varepsilon_{s,r}^{coup}}{dt}$$

extending the classical Boltzmann's approach by taking into account the classical "reversible" macroscopic rotational (ε_r) and "irreversible" (ε_s and $\varepsilon_{s,r}^{coup}$) macroscopic non-equilibrium creative kinetic energies [1] of the small macroscopic continuum region τ . Using the established generalized expression for the entropy production, Dr. Simonenko has shown {3} the temporal reduction of entropy at the initial stage of irreversible transition (Itsweire et al., 1986) of the freely decaying stratified turbulence to internal gravity waves, that revealed the creative constructive role of the established macroscopic non-equilibrium kinetic energies [1]

and, simultaneously, verified the validity of the Prigogine's foresight (about the constructive role of irreversible processes) that the Boltzmann's "identification of entropy with molecular disorder could contain only one part of the truth" (Ilya Prigogine – Autobiography, Translation from the French text, 1977).

Dr. Simonenko generalized ([3], {4}, {5}, {6}) the classical Gibbs formulation (Gibbs, 1873) of the first law of thermodynamics by founding (based on the postulates of thermodynamics, continuum mechanics and hydrodynamics) the generalized formulation (for rotating deformed compressible heat-conducting stratified finite individual macroscopic continuum region τ moving in the surrounding environment and subjected to the non-stationary Newtonian gravity) of the first law of thermodynamics: $dU_{\tau} + dK_{\tau} + d\pi_{\tau} = \delta Q + \delta A_{np,\partial\tau} + dG$ extending the classical Gibbs formulation: $dU = \delta Q - pdV$, ($d\varepsilon \equiv dU$, $-\delta W = -pdV$) by taking into account the infinitesimal increment of the macroscopic kinetic energy dK_{τ} of the continuum region τ , the infinitesimal increment of the gravitational potential energy $d\pi_{\tau}$ of the continuum region τ , the generalized infinitesimal work $\delta A_{np,\partial\tau}$ done by non-potential stress forces acting on the boundary surface $\partial\tau$ of the continuum region τ , the infinitesimal amount dG of energy added (or lost) as the result of the Newtonian non-stationary energy gravitational influence on the continuum region τ along with the classical infinitesimal change δQ of heat and the classical infinitesimal change $dU_{\tau} \equiv dU$ of the internal energy. He generalized the classical Gibbs (1873) expression $\delta A_{np,\partial\tau} = -\delta W = -pdV$ by taking into account (for Newtonian continuum) the infinitesimal works δA_c and δA_s , respectively, of acoustic and viscous forces acting on the boundary surface $\partial\tau$ of the continuum region τ .

Based on the generalized formulation of the first law of thermodynamics, Dr. Simonenko founded ([3], {4}, {5}) the Cosmic Physics (Thermohydrogravodynamics) of the Solar System intended for the long-term deterministic predictions of the strong earthquakes, the planetary cataclysms, the Earth's climate and fresh water resources subjected to the non-stationary energy gravitational influences of the Solar System and our Galaxy. He created the synthesis of the classical theory of the Newtonian gravity with the classical thermodynamical, continuum mechanical, hydrodynamic, astronomical, geological, geophysical, seismological, climatological and hydro-geophysical theoretical approaches. Considering the generalized formulation of the first law of thermodynamics [3] for the planets of the Solar System, Dr. Simonenko founded the cosmic geology ({4}, {5}) by establishing the thermohydrogravodynamic models (of evolution of the Earth and the planets) taking into account the N-layer physical structure of the planetary material continuum, convection in the lower geo-spheres of the Earth (the planet), the density differentiation, the disin-

tegration of radio-active elements, the solar radiation, the cosmic energy gravitational influences of the Solar System and our Galaxy, the interaction of the Earth's geo-spheres, the translational, rotational, and deformational movements of the compressible tectonic plates, the creation of the new planetary fractures in the tectonic plates. Based on the generalized formulation of the first law of thermodynamics [3], he founded ({4}, {5}) the universal energy thermohydrogravodynamic approach of the fracture formation in the geo-spheres of the Earth (of the planet of the Solar System) and established the generalized shear-rotational model of the earthquake focal region by taking into account the classical de Groot and Mazur macroscopic internal rotational and the established macroscopic non-equilibrium kinetic energies [1]. He discovered ({4}, {5}) the galactic energy gravitational genesis of the 100 million years periodicity (Hofmann, 1990) of the endogenous heating of the Earth (and the planets of the Solar System) explained by circulation (characterized by the time period of the 200 million years) of the Solar System around the center of our Galaxy.

Dr. Simonenko established ({4}, {5}, {6}) the relative maximal energy gravitational influences on the Earth induced by the planets of the Solar System, the Moon, and the Sun {6}. He solved the Chandler's problem by founding ({4}, {5}) the cosmic energy gravitational genesis of the Chandler's variation of the latitude (Chandler, 1892) of the Earth related with the combined non-stationary energy gravitational influences of the Sun (corresponding to the time period 1 year in the Chandler's wobble of the Earth's pole) and the Venus, Jupiter, Moon, and Mercury (explaining the range 410-440 days of the Chandler's time periods). Evaluating the relative values of the maximal integral energy gravitational influences on the Earth induced by the planets of the Solar System, the Moon and the Sun, Dr. Simonenko founded the cosmic energy gravitational genesis of the strong earthquakes preparing by the fundamental cosmic energy gravitational influences of the Sun, Venus, Jupiter, Moon, Mars, and Mercury. Using the generalized formulation of the first law of thermodynamics [3] for the Earth subjected to the fundamental cosmic non-stationary energy gravitational influences, Dr. Simonenko founded ({4}, {5}) the cosmic geophysics (including the cosmic seismology, the cosmic volcanology, the cosmic climatology, the cosmic hydrogeophysics, and the cosmic glaciology) by establishing the set of empirically confirmed ({4}, {5}) time periodicities (of the Earth's periodic seismotectonic and volcanic activities, the global Earth's climate variability and the global variability of the quantities of the Earth's fresh water and glacial ice) induced by the different combined combinations of the fundamental cosmic non-stationary energy gravitational influences on the Earth.

Dr. Simonenko founded the generalized thermohydrogravodynamic theory ({4}, {5}) of the Earth's paleoclimate by taking into account the established ({4}, {5}) two significant factors (along with the Milankovich's variability of the solar radiation due to the variation of the eccentricity of the Earth's orbit): a) the Earth's tectonic-endogenous heating related with the periodic continuum deformation induced by the cosmic non-stationary energy gravitational influences on the Earth and b) the atmospheric-oceanic warming (as a consequence of the greenhouse effect) produced by the gravity-induced periodic tectonic-volcanic activation accompanied by increasing output of the greenhouse volcanic gases (especially, the carbon dioxide). He solved the problem of the 100000-year climate periodicity during Pleistocene (Berger, 1999) by founding ({4}, {5}) the cosmic energy gravitational genesis (related with the combined non-stationary energy gravitational influences on the Earth of the Sun, Moon, Mars, Venus, and Jupiter) of the estimated periodicities 94620 and 107568 years of the Earth's global climate variability related with the first established factor a) and the time periodicities 100845 and 121612 years related with the second established factor b).

Dr. Simonenko founded {4} the cosmic energy gravitational genesis of the modern simultaneous increase of the seismotectonic and volcanic activities and the global atmospheric-oceanic warming (related with the estimated {4} approximate 1000-year time periodicities) accompanied by the established {4} intensification of the planetary water-related processes induced by the cosmic non-stationary energy gravitational influences on the Earth of the Sun, Moon, Venus, Mars, and Jupiter. He evaluated {4} the urgency of the nearest vital problem of the world community related with the conservation of the fresh water resources of the Earth. Taking into account the increasing reduction of ice in the melting mountain and arctic glaciers (related with the established {4} modern global atmospheric warming) and the increasing leakage of water through the

increasing fractures and cracks of the Earth's crust to the lithosphere (related with the established {4} increase of the modern seismotectonic activity of the Earth), Dr. Simonenko founded the modern increasing rate of disappearance of the fresh water resources in the mountain, northern and arctic regions of the Earth. Dr. Simonenko founded {4} the recommendations related with the conservation of the increasing glaciers' melting water taking into account the existent and new planetary tectonic fractures and cracks of the Earth's crust induced by the seismotectonic activity of the Earth.

Dr. Simonenko established {4} the cosmic energy gravitational genesis of the strongest Japanese earthquakes by demonstrating the good correspondence of the empirical time periods of recurrence of the strongest Japanese earthquakes and the corresponding time periodicities defined by various Sun-Moon and planetary combinations. Based on the planetary combinations and the Chinese Luhuo 1973, Haicheng 1975, Tang Shan 1976, Bachu 2003, Ruichang 2005 and Yanjin 2006 earthquakes, he predicted {4} the Chinese 2008 earthquakes.

Evaluating the negative consequences of the underground nuclear explosions (especially, the violation of the Earth's water and seismotectonic processes leading to the established {4} decrease of the natural warning omens associated with the prepared Chinese earthquakes), Dr. Simonenko identified {4} the continuing (Northern Korea – 2006) underground nuclear explosions (produced during the established {4} modern planetary activation of the seismotectonic processes of the Earth) as the very dangerous crime against the humanity. Appealing to the world community, Dr. Simonenko recommended {4} to forbid the nuclear explosions (repeated by Northern Korea in 2009) related with perfection of the nuclear weapon during the established {4} modern planetary activation of the seismotectonic and water-related processes of the Earth.

Dr. Simonenko generalized the results ([3], {4}, {5}) of the Cosmic Physics of the Solar System in the monograph "Fundamentals of the Thermohydrogravodynamic Theory of Cosmic Genesis of the Planetary Cataclysms" {6}. Based on the generalized formulation of the first law of thermodynamics ([3], {4}, {5}), he founded the relative maximal energy gravitational influences on the Sun of the planets of the Solar System. He has shown {6} the reduction of the maximal energy gravitational influences on the Sun of the planets of the Solar System in the following sequence (from the maximal Jupiter's influence): Jupiter, Mercury, Saturn, Earth, Venus, Mars, Uranus, Neptune, Pluto. He founded {6} the cosmic energy gravitational genesis of the time periodicities 11-12 years of the solar activity induced by the combined energy gravitational influence on the Sun of the Jupiter, Mercury, Earth, Venus, and Mars. He founded {6} the cosmic energy gravitational genesis of the time periodicity 59 years of the solar activity induced by the combined energy gravitational influence on the Sun of the Jupiter and Saturn. Dr. Simonenko founded {6} the planetary and lunar configurations related with realization of the strong earthquakes and the Earth's planetary geological cataclysms accompanied by the finite change of the space orientation of the Earth's axis of rotation and by the irreversible deformation of the Earth's surface. He founded {6} the corresponding time periodicities of recurrence of the Earth's planetary geological cataclysms induced by the Sun, Moon and the planets of the Solar System, especially by the Mercury, Venus and Jupiter influencing strongly (along with the Sun and the Moon) on the space orientation of the Earth's axis of rotation. Particularly, he founded {6} the Earth's planetary geological cataclysms (characterized by the time periodicity 25896 years) induced by the combined energy gravitational influence on the Earth of the Sun, Moon, Mercury, Venus, and Jupiter aligned in a straight line with the Earth, moreover (in the first catastrophic configuration) the Mercury and the Venus in close conjunction with the Earth (and simultaneously in mutual close opposition), the Jupiter in close opposition with the Earth and the Moon in full moon configuration related with the full lunar eclipse. Dr. Simonenko founded {6} also the second catastrophic configuration (of the Sun, Moon, Mercury, Venus, and Jupiter) characterized by the Mercury and the Venus in close opposition with the Earth, the Jupiter in close conjunction with the Earth and the Moon in new moon configuration related with the full solar eclipse.

At this time, his main interest is related with the development of the numerical algorithms and programming (realized by his associates) for the long-term deterministic prognostication of the strong earthquakes and the planetary cataclysms induced by the non-stationary energy gravitational influences on the Earth of the Sun, Moon, and the planets of the Solar System.

Dr. Simonenko has been honored by the Diploma related with the successful solutions of the physical-mathematical problems and victory in the U.S.S.R. physical-mathematical competition, the Moscow Physical-Technical Institute, Russia, 6 June 1975; by the Honorary Diploma related with the successful solutions of the mathematical problems and victory in the Far Eastern mathematical competition, Russia, 26 March 1976; and by the Award in honor of the victory in competition of the young Far Eastern scientists, Presidium of the Far Eastern Branch of Russian Academy of Sciences, Russia, 1989.

In recognition of his recent scientific achievements, Dr. Simonenko has been honored in 2006 by the IBC Silver Medal "2000 Outstanding Intellectuals of the 21st Century" (Inscription: "GREAT BRITAIN to S V Simonenko Physicist") and has been included in 2006 and 2007 in the 2000 Outstanding Intellectuals of the 21st Century, IBC, Cambridge, England. Dr. Simonenko has been honoured in 2007 by the IBC Silver Medal "Outstanding Scientists of the 21st Century" (Inscription: "GREAT BRITAIN to Dr S V Simonenko Physicist"), by the IBC Diploma in recognition of the outstanding contribution in the field of Non-equilibrium Statistical Thermohydrodynamics of Turbulence {2} and Thermohydrogravidynamics of the Solar System {4} and has been included in the Inaugural Edition of the Outstanding Scientists of the 21st Century, IBC, Cambridge, England. Dr. Simonenko has been honored in 2008 by the IBC Silver Medal "2000 Outstanding Intellectuals of the 21st Century" (Inscription: "To Dr. S.V. Simonenko Creator of Cosmic Geophysics") and has been included in the 2000 Outstanding Intellectuals of the 21st Century, IBC, Cambridge, England. His achievements have been recognized in 2008 by the Pinnacle of Achievement Award for his exceptional achievements in the arena of the turbulence problem solution (Certificate Number 35, IBC, Cambridge, England, 14 February 2008), by inclusion into the Cambridge Blue Book for his outstanding contribution in the field of Turbulence and Water-related Cosmic Processes (Certificate, IBC, Cambridge, England, 2 December 2008), by the Da Vinci Diamond Award in recognition of his outstanding contribution to the solutions of the turbulence and the Chandler's problems (Certificate Number 79, IBC, Cambridge, England, 14 February 2008), by the Lifetime Achievement Award in recognition of his outstanding contribution to Physics of Turbulence and Cosmic Geophysics (Certificate, IBC, Cambridge, England, May 2008; the IBC Golden Medal, Inscription: "Presented to Dr. S V Simonenko the Founder of Turbulence and Solar System Physics"), by inclusion into the Dedication of the 2000 Outstanding Intellectuals of the 21st Century in honor of his outstanding contribution to Physics and Geophysics related with solutions of the turbulence and the Chandler's problems (Certificate, IBC, Cambridge, England, 12 June 2008), by inclusion into the Greatest Intellectuals of the 21st Century (IBC, Cambridge, England), by inclusion into the Top Two Hundred of the IBC, (IBC, Cambridge, England), by inclusion into the Dictionary of International Biography (34th Edition, IBC, Cambridge, England) and by appointment as the Honorary Director General of the IBC (Certificate of ppointment, IBC, Cambridge, England, 28 April 2008). Dr. Simonenko has been honored in 2009 by the IBC Silver Medal "2000 Outstanding Scientists" (Inscription: "Dr. S.V. Simonenko, Founder of Cosmic Geology") and has been included in 2000 Outstanding Scientists, IBC, Cambridge, England. His achievements have been recognized in 2009 by inclusion into the Dictionary of International Biography (35th Edition, IBC, Cambridge, England), by inauguration as the Vice President of the Recognition Board of the World Congress of Arts, Sciences and Communications (Cambridge, England), by ABI Gold Medal for Russia in the name of Russian people and Russia, by the IBC'S Salute to Greatness Award (IBC, Cambridge, England), by nomination into the ABI Order of International Ambassadors related with the appointed personal title "The Honorable" and the nomination for the valiant International Peace Prize awarded by the United Cultural Convention of the United States of America. His e-mail addresses are sergeysimonenko@mail.ru and drsergeyvsimonenkohondgibc@yahoo.com. More information on Dr. Simonenko can be found at www.DrSergeyVSimonenkoHonDGIBC.ru.