

Professor Sergei Eremenko - on the path of discoveries

Professor Sergei Eremenko, PhD, Doctor of Engineering, Honorary Professor publishes books and papers with novel ideas and hypotheses

SYDNEY, NEW SOUTH WALES, AUSTRALIA, February 8, 2021 /EINPresswire.com/ -- [Sergei Eremenko](#), an Australian-Ukrainian scientist and author of three books, PhD, Doctor of Engineering, Professor, Honorary Professor of the National Aerospace University "Kharkiv Aviation Institute", formerly one of the youngest professors in the world holding both an academic title and a position of a Professor, has published popularization book '[Soliton Nature](#)' and series of papers with novel ideas



Professor Sergei Eremenko with Book

SOLITON NATURE BOOK:

Dedicated to a broad audience and scientists, this new-generation, easy-to-read, pictorial, interactive book uses beautiful photography, [video channel](#), and computer scripts in R and Python to demonstrate existing and explore new solitons – the magnificent and versatile energy concentration phenomenon of nature. With 200 images and videos collected around the world and on magnificent Australian beaches, we describe captivating stand-alone ocean solitons capable of travelling hundreds of miles uninterrupted. Along with scary tsunamis, the tricky solitonic bores propagating upstream narrow river channels may cause disasters for coastal cities. Sudden killer rogue waves endanger even large ships. Powerful tornadoes, surfing tubes, whirlpools and rotating galaxies are solitonic vortices. Unique videos of breathers and soliton envelope waves, with legendary 'Ninth Wave' in the middle, are commented by some legendary scientists. Beautiful photography of square grid waves confirms tendency of nature to produce multi-dimensional formations. Solitonic dislocations and defects are widespread in metal shapes around us. Solitonic energy localization effects appear in swing movements of humans perfected them in many sports and dances. We also explore new solitonic hypothesis and theories. Geosolitons may have played an important role in formation of mountain ranges and sedimental rocks. Using solitonic functions for heart blood pressure pulses may lead to new-generation

devices. Solitonic dislocation and stability effects may exist in behavior of correlated financial markets. New class of atomic solitons can be used to describe Higgs boson ('the god particle') fields, spacetime quanta and other fundamental building blocks of nature. Readers are welcomed to subscribe and provide own videos to our dedicated video channel and website www.solitonnature.com.

SOLITONNATURE.COM WEB SITE AND BOOK TRAILER:

Welcome to visit the book web site www.solitonnature.com featuring slideshow of colorful images, beautiful videos, testimonials, and information about the author. Book trailer is https://youtu.be/cZMZdW_3J84.

SOLITON NATURE VIDEO CHANNEL:

It is convenient for readers of the electronic book version to refer directly to the YouTube Soliton Scientific Video Channel <https://www.youtube.com/watch?v=2lABLplcevo>, for instant viewing of supporting material which features amazing videos of solitary, grid, envelope waves and the development of interesting new scientific hypotheses. Subscribers can submit their own videos and pictures, to be included in the video channel and in future versions of the book.

EMERGING THEORIES AND NEW HYPOTHESES:

The book and author's papers describe some new hypotheses which may evolve into major scientific theories and products.

SOLITONIC BLOOD PRESSURE PULSES:

Sergei explores the hypothesis that soliton bore effect play an essential role in the functioning of a human heart and the propagation of blood pressure pulses in blood vessels. Blood pressure pulse, which we feel at our wrists every second, maybe a combination of a primary KdV soliton wave generated by a heart, and of a reflected pressure wave, after the pulse has reached the fingers. The combined pulse can be presented as the sum of two KdV soliton functions. If confirmed by medical specialists, the theory may lead to new generation soliton blood pressure measurement devices that may help in the treatment of hypertension for billions of people around the world.

GEOSOLITONS and ENVELOPE SHAPES OF MOUNTAIN RANGES:

Sergei proposes new idea and the theory that solitonic stability principles have played important role in wavy enveloped formations of some mountain ranges and structure of layered sedimental rocks leading to the novel concept of GEOSOLITONS. The idea is featured in YouTube video <https://www.youtube.com/watch?v=4YghdUW66As> and published in the book 'Soliton Nature'. These ideas may lead to improving exploration methods in geology.

SOLITONIC EFFECTS IN FINANCIAL MARKETS:

The book and papers describe some new ideas in financial markets. Firstly, the markets have a concept of a lattice – discrete price levels where the market orders are located. The 'market solitons' are not mysterious waves, but so-called 'solitonic dislocations', liquidity gaps, deficits and imbalances capable to grow, shrink, evolve, and cause market swings from one state of dynamic equilibrium to another. Secondly, solitonic stability effects – in a generic sense of a dynamic balance – can be introduced in the self-supporting behavior of highly correlated financial markets. Thirdly, markets are often move via series of large pendulum-like transitional swings from one state of demand-supply equilibrium to another. This demonstrates the versatility of solitonic concepts not only in nature but also in the behavior of complex systems.

ASTRING SPACETIME QUANTA AND ATOMIC SOLITONS:

This emerging theory is based on novel ideas to describe spacetime quanta and other mathematical 'building blocks' of field theories with ATOMIC SOLITONS – a new class of mathematical topological lattice solitons based on extensions of the theory of atomic functions developed since 1970s by followers of author's teacher, Academician NAS of Ukraine, V.L. Rvachev. These new mathematical solitons possess a unique set of properties – solitariness, ability to compose 'solitonic atoms' representing quanta, and represent different fields including spacetime continuum via superposition of quanta. This gives a chance to propose to physicists some variants of unification theories, where different fields can be represented by shifts and stretches of atomic soliton functions called AStrings. This idea, first published in Sergei Eremenko's 2018 paper, has received many recommendations on ResearchGate scientific network

<https://www.researchgate.net/publication/329455498> Atomic solitons as a new class of solitons.

ON THE PATH OF DISCOVERIES:

While providing consulting services for world-blue chip companies for 20+ years, Sergei continues scientific research in new models of theoretical physics including Atomic Quantum Gravity, Spacetime and fields quantization, as well as applied areas like 'Atomic Machine Learning and Artificial Intelligence', for wide range of applications in Health and Insurance Industries, AIML trading systems and models of Financial Markets.

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