

CV by Alexey Stakhov

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Stakhov, Alexey Petrovich (Russian: Стахов, Алексей Петрович, Ukrainian: Стахов, Олексій Петрович) born (May 7, 1939) – Ukrainian mathematician, inventor and engineer, who has made contributions to the theory of numeral systems with irrational bases and their applications in computer science and digital metrology and also to the Mathematics of Harmony as new interdisciplinary direction of modern science. Doctor of Computer Science (1972), Professor (1974). Author of over 500 publications, 14 books and 65 international patents.



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1. Biography

Born May 7, 1939 in Partizany, Kherson region, Ukraine, USSR. In 1956 graduated with honours from high school of Rivne village, Kherson region. Same year became a student of the Mining Faculty of the Kiev Polytechnic

Institute (now the National Technical University of Ukraine “Kiev Polytechnic Institute”). In 1959, transferred to the Radio Engineering Faculty of Kharkiv Aviation Institute (now the National Aerospace University of Ukraine). After graduation, worked for two years as an engineer in the Kharkiv Electrical Instrument Design Bureau (now the space technology company “Khartron”). "Khartron" was one of the top secret space companies of the Soviet Union. It was engaged in the research, development and manufacture of automatic control systems for missiles and space craft on board systems. Through working there Stakhov obtained thorough practical engineering experience and published his first scientific papers. Later he worked at the universities of Russia and Ukraine (Kharkiv Institute of Radio Electronics, Taganrog Radio Engineering Institute, Technical University of Vinnitsa, Vinnitsa Agricultural University, Vinnitsa Pedagogic University). He was a visiting professor at many universities abroad (Austria, Germany, Libya, Mozambique). Since 2004 lives and works in Canada.

2. Teaching, research, and work

- Dean of the Faculty of Computer Engineering of the Kharkov Institute of Radio Electronics (now, Kharkov National University of Radio Electronics), 1968–1970
- Head of the Department of Informational and Measuring Engineering, Taganrog Radio Engineering Institute, 1971–1977
- Head of the Department of Computer Engineering, Vinnitsa Polytechnic Institute (now – Vinnitsa National Technical University), 1977–1988
- Director of the Special Design and Technological Bureau "Module" of the Vinnitsa Polytechnic Institute, 1986–1989

- Head of the Department of **Applied Mathematics and Computing Systems**, Vinnitsa Technical University, 1989–1996
- Head of the Department of Computer Science, Vinnitsa State Agricultural University (now **Vinnitsa National Agrarian University**), 1997–2004
- Member of the **Shevchenko Scientific Society in Canada** (2005)
- Professor Emeritus of **Taganrog University of Radio Engineering**
- Since 2003, President of the **International Club of the Golden Section**, and from 2005, Director of the **Golden Section Institute, Academy of Trinitarizm** (Russia).
- Initiated the creation of the so-called "Slavic Golden Group" (Kiev, 1992) and was Scientific Director of the **International Congress on the Mathematics of Harmony** (Odessa, 2010).
- In 2009 he was awarded the Medal "Knight of Arts and Sciences" (**Russian Academy of Natural Sciences**)

3. **Brief description of research and scientific achievements**

- Created a new direction in the measurement theory, the **algorithmic measurement theory** described in his book – A.P. Stakhov. "Introduction into Algorithmic Measurement Theory" (**Moscow**: Soviet Radio, 1977).
- Created the theory of the **redundant¹ numeral systems** based on the generalised **Fibonacci numbers** (**Fibonacci p -codes**) and the generalised **golden proportions** (codes of the golden p -proportion). The principals of the **Fibonacci p -codes** and the new computer arithmetic based on them are described in his book – A.P. Stakhov. "Introduction into Algorithmic Measurement Theory" (Moscow: Soviet Radio, 1977). The fundamentals of the theory of the codes of the **golden p -proportion** are stated in the book – AP Stakhov. The Codes of the Golden Proportion (**Moscow**, Radio and Communication, 1984).

- Put forward the concept of "Fibonacci computers" and "golden" digital metrology (analog-to-digital and digital-to-analog converters). The international priority of the invention in these fields was protected by 65 international patents of U.S.A, Japan, U.K., France, Germany, Canada and other countries.
- Elaborated and evolved the concept of "Mathematics of Harmony", which goes back in its foundations to Euclid's "Elements" (III c. BC), "Divina Proportione" (Divine proportion) by Luca Pacioli (1509), Harmonice Mundi (Harmony of the World) by Johannes Kepler (1619). For the first time the concept of "Mathematics of Harmony" in relation to the achievements of modern science was presented by Prof. Stakhov in the speech "The Golden Section and Modern Harmony Mathematics," made at the 7th International Conference "Fibonacci Numbers and Their Applications" (Austria, Graz, 1996). The book "The Mathematics of Harmony. From Euclid to Contemporary Mathematics and Computer Science" – 748 pages (World Scientific, 2009) is Stakhov's main scientific achievement in this field.
- Published over 500 scientific works, among them 14 books, 65 international patents, 130 USSR invention certificates. During his work in Canada (2004–2012) published about 40 articles in international journals (Chaos, Solitons & Fractals, Applied Mathematics, Arc Combinatoria, Congressus Numerantium, Visual Mathematics, British Journal of Mathematics and Computer Science, etc.).
- Alexey Stakhov had prepared 30 PhD students, five of Stakhov's PhD students became Doctors of Sciences.

4. Work in international universities as "Visiting Professor"

- Vienna Technical University (Austria, 1976)
- University of Jena (Germany, 1986)
- Dresden Technical University (Germany, 1988)

- Al Fateh University (Tripoli, Libya, 1995–1997)
- University of Eduardo Mondlane (Maputo, Mozambique, 1998–2000)

5. Prizes and awards

- Award for the best scientific publication by Ministry of Education and Science of Ukraine (1980)
- Barkhausen’s Commemorative Medal issued by the Dresden Technical University as "Visiting Professor" of Heinrich Barkhausen Department (1988)
- The Gold Medal of the Exhibition of Achievements of National Economy of the USSR (1988).
- «The 2000 Millennium Medal of Honour», issued by the American Biographical Institute
- Professor Emeritus of Taganrog University of Radio Engineering (2004)
- The honorary title of "Knight of Arts and Sciences" (Russian Academy of Natural Sciences, 2009)
- The honorary title "Doctor of the Sacred Geometry in Mathematics" (American Society of the Golden Section, 2010)
- Prof. Alexey Stakhov has been included in the Encyclopedia “Famous Scientists of Russia”
- Leonardo Fibonacci commemorative medal (Interdisciplinary Journal “De Lapide Phylosoforum, 2015)

6. The most important scientific publications

1. The book Stakhov AP. “Introduction into Algorithmic Measurement Theory” (Moscow: Soviet Radio, 1977) (in Russian)
2. The book Stakhov AP. “Codes of the Golden Proportion” (Moscow: Radio and Communication, 1985) (in Russian)
3. The brochure “Noise-immune codes. Fibonacci computer” (Moscow: Publishing House “Knowledge”, 1989) (in Russian).

4. The book Alexey Stakhov, Yury Orlovich and others. "Data encryption in the information-recording systems" (Kiev, Technique, 1985) (in Russian)
5. The article Stakhov A.P. "Brousentsov's ternary principle, Bergman's number system and ternary mirror-symmetrical arithmetic". The Computer Journal, 2002.
6. The article Alexey Stakhov. "Generalized golden sections and a new approach to the geometric definition of the number". Ukrainian Mathematical Journal, 2004, Vol. 56, No. 8 (in Russian)
7. The book Alexey Stakhov. Assisted by Scott Olsen. "The Mathematics of Harmony. From Euclid to Contemporary Mathematics and Computer Science" (World Scientific, 2009)
8. The article Alexey Stakhov. "The "Golden" Number Theory and New Properties of Natural Numbers". British Journal of Mathematics & Computer Science 11(6), 2016
9. The article Alexey Stakhov. "Fibonacci p-codes and Codes of the Golden p-proportions: New Informational and Arithmetical Foundations of Computer Science and Digital Metrology for Mission-Critical Applications". British Journal of Mathematics & Computer Science, 17 (1), 2016.
10. The article Alexey Stakhov. "The importance of the Golden Number for Mathematics and Computer Science: Exploration of the Bergman's system and the Stakhov's Ternary Mirror-symmetrical System (Numeral Systems with Irrational Bases)". British Journal of Mathematics & Computer Science, 18(3): 1-34, 2016
11. The book Alexey Stakhov and Samuil Aranson. Assisted by Scott Olsen. The "Golden" Non-Euclidian Geometry. Hilbert's Fourth Problem, "Golden" Dynamical Systems, and the Fine-Structure Constant. (World Scientific, 2016).

7. External links

1. **Jump up**[^] Mitropolsky YA (Ukraine). The Mathematics of Harmony by Professor Stakhov (in Russian)
<http://www.trinitas.ru/rus/doc/0232/012a/02322020.htm>
2. **Jump up**[^] Volkmar Weiss (Germany). A breakthrough or even more! Review on the book A.P. Stakhov. The mathematics of Harmony. From Euclid to Contemporary Mathematics and Computer

Science (World Scientific, 2009),

Amazon.com <http://www.amazon.com/Mathematics-Harmony-Everything-Alexey-Stakhov/dp/981277582X>

3. **Jump up**^ Scott A. Olsen, Professor Alexey Stakhov is an absolute genius of modern science (in Honour of Alexey Stakhov's 70th Birthday) // «Academy of Trinitarism, Moscow, № 77-6567, Electronic Publication.15281, 11.05.2009 (in English and Russian) <http://www.trinitas.ru/rus/doc/0232/012a/02322061.htm>
4. **Jump up**^ Famous Scientists of Russia – Alexey Stakhov (in Russian) <http://www.famous-scientists.ru/12287>