# THE MATHEMATICS OF HARMONY. FROM EUCLID TO CONTEMPORARY MATHEMATICS, COMPUTER SCIENCE AND MODERN MATHEMATICAL EDUCATION

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## Abstract

*One may wonder what place in the general theory of mathematics is occupied by Mathematics of Harmony created by Prof. Stakhov? It seems to me, that in the last centuries, as Nikolay Lobachevsky said, "mathematicians turned all their attention to the Advanced Parts of Analytics, neglecting the origins of Mathematics and not willing to dig the field that already been harvested by them and left behind." As a result, this created a gap between "Elementary Mathematics" - basis of modern mathematical education, and "Advanced Mathematics". In my opinion, the Mathematics of Harmony developed by Prof. Stakhov fills up that gap. I.e, "Mathematics of Harmony" is a big theoretical contribution, first of all to the development of "Elementary Mathematics" and as such should be considered of great importance for mathematical education.*

*From Academician Mitropolsky's commentary on the scientific research of Ukrainian scientist Alexey Stakhov.*

The present speech is based on author's book "The Mathematics of Harmony. From Euclid to Contemporary Mathematics and Computer Science" (World Scientific, 2009) [1] and other newest author's publications in the "World Scientific" [2,3] and the International Journals "Chaos, Solitons and Fractals", "Congressus Numerantium", "The Computer Journal", "Applied Mathematics", "British Journal of Mathematics and Computer Science" [4-27].

The main goal of the speech is to discuss author's experience in teaching of the course "Mathematics of Harmony and Golden Section" for students of the Mathematics and Physics Faculty of the Vinnitsia Pedagogical University (2001-2002 academic year). Abramchuk's article [28] is the beginning of this discussion.

The author submits the following questions for discussion:

1. Pythagorean MATHEM's as the most important parts of mathematics
2. The "Golden" Section and Platonic Solids in Euclid's Elements
3. Proclus hypothesis as new view on Euclid's Elements
4. Turing phyllotaxis
5. The mine motives of the American mathematicians for the creation of modern theory of Fibonacci numbers
6. Binet formulas and the "golden" hyperbolic Fibonacci and Lucas functions as the basis for Bodnar's geometry of phyllotaxis as continuation of Turing phyllotaxis
7. Gazale formulas and Spinadel "metallic' proportions as the basis of the hyperbolic lambda functions
8. The "Golden" Non-Euclidean geometry and new challenge for theoretical natural sciences
9. The numeral systems with irrational bases as the fundamentals of new computer science and digital metrology for mission-critical applications
10. Program of the course ""Mathematics of Harmony and Golden Section" [29]

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