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PEBBLES, TURTLES AND THE GÖMBÖC: NATURAL NUMBERS AND NATURAL SHAPES

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Abstract

Russian mathematician V.I. Arnold conjectured that convex, homogeneous bodies with less than four equilibria (also called mono-monostatic) may exist. Not only did his conjecture turn out to be true, the newly discovered objects show various interesting features. Our goal is to tell the story of the discovery, give an overview of these findings as well as to present some new results. We will point out that mono-monostatic bodies are neither flat, nor thin, they are not similar to typical objects with more equilibria and they are hard to approximate by polyhedra. Despite these "negative" traits, there seems to be strong indication that these forms appear in Nature due to their special mechanical properties. The idea of the Gömböc resulted in a new approach to natural shapes. In the second part of the talk we review some of these applications in biology, geology, paleontology and astrophysics.

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Time: 15:00

Place: IMBM Seminar Room, Boğaziçi University