Gömböc: math theorem, engineering marvel & art inspiration

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What is the Gömböc?
The Gömböc, this special geometric shape, is a result of an ingenious mathematical question asked by one of the most influential mathematicians of the 20th century, Vladimir Igorevich Arnold: can convex, homogeneous objects with just two balance points exist? The Gömböc is the first known such shape and it self-rights on a horizontal surface like a weeble, however, unlike the toy, it has no added bottom weight.

Prestigious universities (e.g. Princeton, Cambridge, Heidelberg, Cornell, Oxford, Berkeley, Tokyo, Sorbonne and Harvard) and collections (e.g. Windsor Castle, the Hungarian National Museum) have put uniquely numbered Gömböc models on permanent exhibit. The Gömböc motivated the development of a geometrical theory with applications ranging from biology through palaeontology to geophysics and planetology, the latter not only helping NASA to identify ancient rivers on the Red Planet but also explaining the spaceship-like shape of the first interstellar asteroid ‘Oumuamua. The Gömböc shape drove cutting-edge innovation in robotics and drug delivery and it inspired not only the development of the simulation software for the sailing yacht winning 2017 America’s Cup but also the work of leading contemporary conceptual artist Ryan Gander.

“The Gömböc appears to be on the edge of physical reality. It exists, but barely so,” describes co-inventor Gábor Domokos the extreme sensitivity of the shape for which the manufacturing tolerances are daunting, requiring a precision of 1/100mm for a Gömböc with maximal diameter of 100mm. In addition to its scientific significance, the Gömböc has become a popular and prestigious gift for businesses and individuals. Gömböc models are available in aluminum, transparent and black plexiglass, stainless steel, and bronze at gomboc-shop.com. For the upcoming holidays this special ornament, which is on the border of science and art, can be a precious gift.
Contact Information
Eniko Biro
Dolphio Technologies Ltd.
http://gomboc-shop.com
+36 209573357

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