

The Shape of the Planet Earth? An Unexpectedly Deep Mathematical Challenge!

by
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Abstract:

Our planet Earth is rotating. The centrifugal force produces some equatorial bulge so that the Earth is not exactly spherical. The mathematical question of the determination of the shape of a rotating body has been central in the development of mathematics for several centuries. Newton was the first to get an estimate of the flattening of the Earth by a purely theoretical reasoning, «without having to get out of his home», as Voltaire wrote. This lecture will not discuss geophysics. On the contrary, I would like to focus on the purely mathematical theory raised by this problem, which was at the origin of the crucial scientific concept of «bifurcation». I will discuss historical developments, like for instance the surprising discovery by Poincaré of rotating bodies having the shape of a pear! This discovery is purely theoretical since nobody has never witnessed such an object rotating in space. This topic is indeed a wonderful example of the interaction between pure and applied science. Even though the question has been studied by the greatest mathematicians since 350 years and many discoveries have been made, many important questions still remain open.

Date: 5 October 2016 (Wednesday)
Time: 4:30 pm
Venue: Connie Fan Multi-media
Conference Room
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