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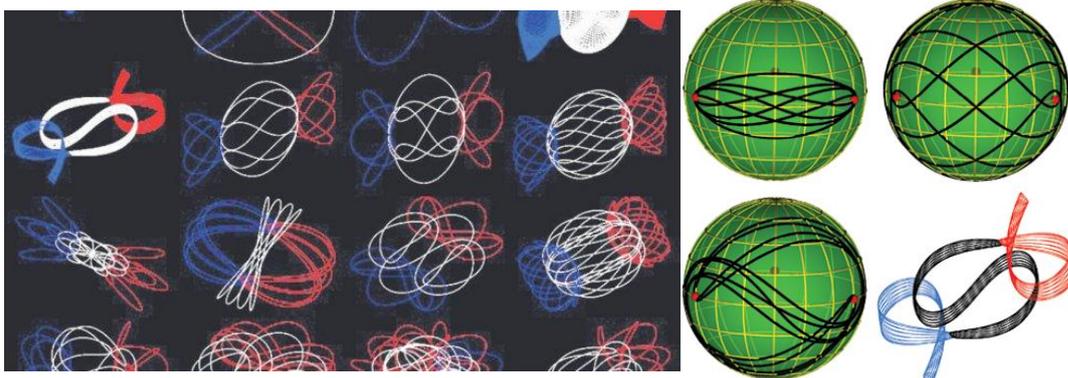
13 New Solutions to Three-Body Problem

Veljko Dmitrasinovic (University of Belgrade in Serbia)

Veljko Dmitrasinovic, professor of the Institute of Physics, Belgrade in Serbia, obtained his doctor's degree from College of William and Mary in 1988. Recently, he and his collaborator Milovan Suvakov found 13 new solutions to the three-body problem—predicting patterns that describe how three bodies will orbit around each other in space in a repeating pattern. The two describe how they came up with their solutions using computer simulations in their paper published in Physical Review Letters.

Abstract

The three-body problem dates back to the 1680s. Isaac Newton had already shown that his new law of gravity could always predict the



orbit of two bodies held together by gravity—such as a star and a planet—with complete accuracy. The orbit is basically always an ellipse. However, Newton couldn't come up with a similar solution for the case of three bodies orbiting one another. For two centuries, scientists tried different tacks until the German mathematician Heinrich Bruns pointed out that the search for a general solution for the three-body problem was futile, and that only specific solutions—one-offs that work under particular conditions—were possible. Generally, the motion of three bodies is now known to be nonrepeating.

The discovery of 13 new families, made by physicists Milovan Suvakov and Veljko Dmitrasinovic at the Institute of Physics Belgrade, brings the new total to 16. The next step for the Belgrade physicists is to see how many of their new solutions are stable and will stay on track if perturbed a little. If some of the solutions are stable, then they might even be glimpsed in real life.

All are welcome! Tea, coffee, biscuits will be served at 10:15 A.M.

You are welcome to nominate speakers to Weimin Yuan (wmy@nao.cas.cn), Mei Zhang (zhangmei@bao.ac.cn), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn), Shude Mao (smao@nao.cas.cn)