

Pure mathematics behind the mechanics

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Dutch researcher Peter Hochs has discovered that the same effects can be observed in quantum and classical mechanics, if quantisation is used.

Whereas classical mechanics describes how balls fall, pendulums swing and the Earth revolves around the Sun, quantum mechanics describes extremely small things such as atoms and does not in the slightest bit resemble its classical cousin.

At least not on the face of it. Quantisation is a technique that allows the relationship between classical mechanics and quantum mechanics to be studied: if we know how it works in classical terms then can we say something about how it works in quantum mechanics?

Hochs' research focused on the role played by symmetry in classical and quantum mechanics: this symmetry allows the matter to be simplified, so-called reduction. Hochs has demonstrated that in certain cases quantisation commutes with reduction. This means that the simplification you can perform if symmetry is present has the same effect in both quantum and classical mechanics.

Hoch's research was part of one of the last Pioneer projects of NWO Division for Physical Sciences. In 2002, this programme was superseded by the Innovative Research Incentive Scheme, in which Veni Vidi and Vici grants are awarded to outstanding researchers.

Source: NWO

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