Berlin Mathematical School

BMS Women In Mathematics

Lecture Series

Thursday 8 March 2012 at 16:00

Tea and cookies will be served after the lecture

FU Berlin, SR 053, Takusstraße 9, 14195 Berlin

Carla Cederbaum

(Duke University)

The Newtonian Limit of General Relativity

Einstein's General Relativity is a geometric theory of space, time, and gravitation. In some sense, it is the successor of Newton's famous theory of gravitation -- the theory Newton is said to have come up with when an apple fell onto his head. But although Einstein's theory is much better at predicting gravitational effects in our universe, Newton's theory is not at all outdated or even obsolete. In fact, many astrophysical measurements and simulations still heavily rely on Newtonian intuitions, calculations, and concepts.

In the talk, Carla Cederbaum will explain how and to what extent this usage of Newtonian theory in astrophysics and related fields is motivated and mathematically justified. This will lead us to the notion of Newtonian limit. We will also see some examples for the behavior of relativistic quantities like mass and center of mass under this Newtonian limit.

Carla Cederbaum studied mathematics, physics, and computer science in Freiburg, Cambridge, and Berlin. In July 2011, she completed her PhD on "The Newtonian Limit on Geometrostatics" at FU Berlin and the MPI for Gravitational Physics. Since August 2011, she is Assistant Research Professor for Mathematics at Duke University in North Carolina, USA.

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