Kolloquium

physikalisches

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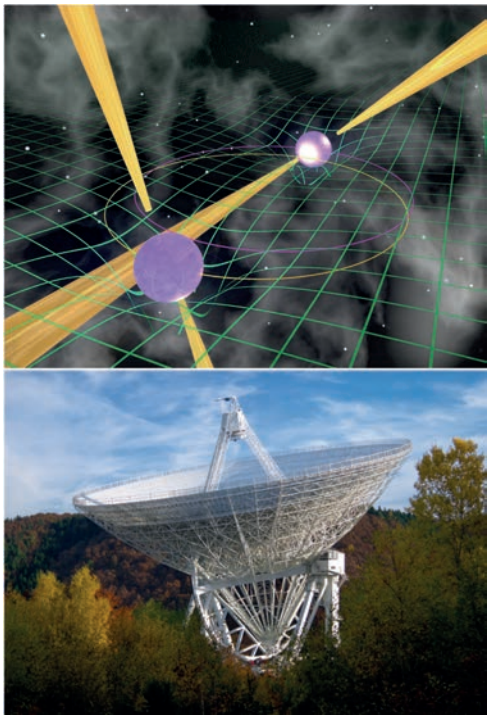
Precision gravity tests with radio pulsars

Mo. 27.10.14
16:00 Uhr
Ort: H34

The discovery of the first binary pulsar by Russell Hulse and Joseph Taylor in the summer of 1974 initiated a completely new field for testing relativistic gravity. For the first time the back reaction of gravitational radiation on a binary motion could be studied, which gave the first evidence for the existence of gravitational waves as predicted by Einstein's general relativity. Furthermore, the Hulse-Taylor pulsar provided the first test bed for the gravitational interaction of strongly self-gravitating bodies.

To date there are a number of radio pulsars known, which can be utilized for precision tests of gravity. Depending on their orbital properties and their companion, these pulsars provide tests for various different aspects of relativistic gravity. In particular, the so called ‚Double Pulsar' has more than lived up to our early expectations, and by now is the best „laboratory" for Einstein's general theory of relativity.

In my talk I give an introduction to gravity tests with pulsars, and highlight some of the most important results. In addition, I give a brief outlook into the future of this exciting field of experimental gravity.



Top: Artist's impression of the Double Pulsar, currently the best "laboratory" for testing general relativity (Credit: M. Kramer).

Bottom: The 100-m Effelsberg radio telescope of the Max Planck Institute for Radio Astronomy, near Bonn (Credit: N. Tacken).