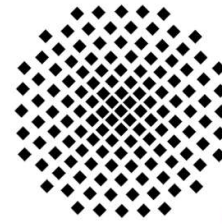


Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

Ansprechpartner: Prof. Harald Giessen
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Achtung: geänderte Uhrzeit!

Dienstag, 22. Oktober 2019

17:15 Uhr

Hörsaal V 57.01

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

Antrittsvorlesung Ronny Nawrodt, Universität Stuttgart, Telefon: 0711 - 685-67465

Measuring tiny signals – the detection of gravitational waves

Ronny Nawrodt - Antrittsvorlesung
Universität Stuttgart

Abstract

Gravitational waves have been predicted within Einstein's Theory of General Relativity. It took scientists nearly 100 years to build the world's most sensitive instruments that were able to directly detect these waves in the curvature of space-time appearing as tiny changes in geometric lengths. Sensitivities in length changes of better than 10^{-18} m are necessary to measure gravitational waves. The first few detections over the last years have impressively demonstrated the rich information content of the gravitational wave signals, which open up a new window to the universe. The talk will give a short overview of the physics of gravitational wave detection and answer the question „How can we increase the detectors sensitivity further to pave the way for gravitational wave astronomy?“ Several noise sources such as seismic noise, quantum noise as well as thermal noise of the optical components are currently the limitation for further sensitivity improvements and will be discussed.

Furthermore, the successful hunt for gravitational waves is a prime example of interdisciplinary science bringing together researchers from many different fields of science. It is an ideal starting point to motivate young high school students for STEM subjects and bring them in contact with modern science.