

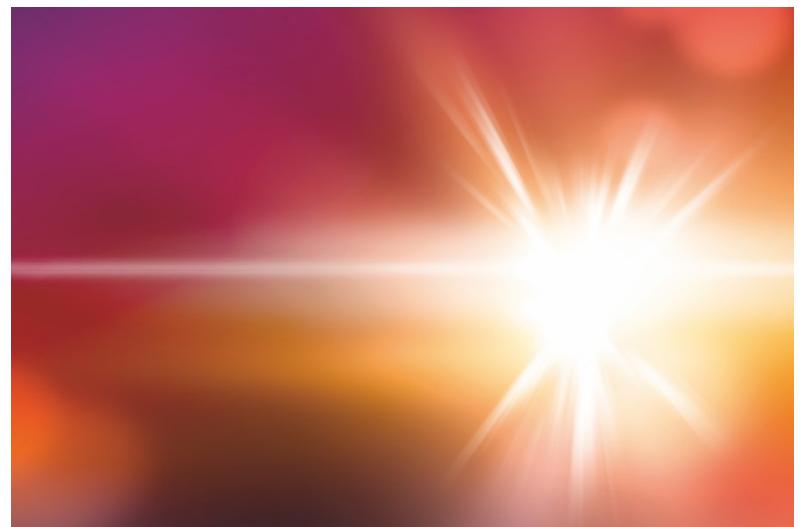


# The LUXE Experiment in Hamburg: probing quantum physics in a new regime.

**Tuesday, 27 August 2019, DESY Auditorium, 16:45 h**

**Beate Heinemann (DESY & Freiburg Univ.)**

This talk describes LUXE (Laser Und XFEL Experiment), an experiment that aims to use the high-quality and high-energy electron beam of the European XFEL and a powerful laser. The scientific objective of the experiment is to study quantum electrodynamics in the regime of strong fields, close to and beyond the Schwinger critical field. Within a strong electromagnetic field, the vacuum itself is expected to become unstable and spark with spontaneous creation of electron-positron pairs. This experimentally new regime is relevant to a variety of phenomena in Nature, e.g. in the areas of astrophysics, collider physics or atomic physics. It is anticipated that in the LUXE experiment electrons accelerated by the European XFEL Linac shall experience a field three times larger than the critical field, and pioneer this regime of quantum physics. In this talk the science case and the experimental setup are described. The setup requires in particular the extraction of a minute fraction of the electron bunches from the European XFEL Linac, the installation of a powerful laser with sophisticated diagnostics, and an array of precision detectors optimized to measure electrons, positrons and photons.



- **Coffee, tea and cookies will be served at 16:30h**
- **After the colloquium there is a chance for private discussions with the speaker over drinks and pretzels**