**Sonderforschungsbereich TRR 160**

Kohärente Manipulation wechselwirkender Spinanregungen
in maßgeschneiderten Halbleitern

# Seminarankündigung

**Donnerstag, 17.10.2019, 12:00 Uhr**
**P1-02-110**

## "Generation and amplification of electromagnetic waves using semiconductor superlattices"

**Vortragender: Alexander Balanov**
**Loughborough University, United Kingdom**

## Abstract:

Semiconductor superlattices (SLs) comprise multiple alternating layers of different semiconductor materials, which produces a periodic modulation of the conduction band. This creates a tunable, quantum mechanical environment suitable for the realization of the so-called Bloch gain, which can be used for the generation of THz waves. However, the same quantum mechanisms that induce the Bloch gain result in electric instability leading to the formation of moving high-field charge domains. The talk will review some of our recent theoretical and experimental results on utilization of the moving charge domains for the generation of high-frequency current oscillations and amplification of sub-THz/THz signals. In particular, we will discuss the enhancement of high-frequency generation in the presence of a tilted magnetic field, generation of microwave chaos in a SL coupled to a resonator, microwave output from electromagnetically coupled SLs, and amplification of sub-THz/THz signals on the moving charge domains.