UNIVERSITÄT DUISBURG ESSEN

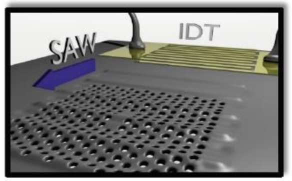
PHYSIK E=

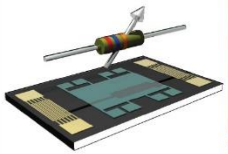
Physikalisches Kolloquium

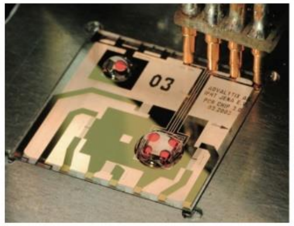
Mittwoch, 20.10.2021
13:00 Uhr
Hörsaal MC 122

The perfect wave

Prof. Dr. Achim Wixforth, University of Augsburg







EXP
Universität Augsburg
Lehrstuhl für
Experimentalphysik I

Many materials have remarkable electronic, mechanical and optical properties that have led to a true technological revolution in recent years. Semiconductors or semiconductor layer systems in particular play a special role here. This is especially true for systems whose dimensions have been reduced to the nanometer scale. Nevertheless, it is often possible to further improve their properties considerably by hybridizing different material systems and to adapt them to new challenges.
In this lecture, I will present some such hybrid systems in which completely new functionalities can be achieved through the interaction of the materials with *surface acoustic waves*, formerly known from high frequency processing devices like, e.g. being usen in cell phones.
Surface acoustic waves are the nanometer analogue of an earthquake. They can propagate on the surface of certain materials and have a lasting effect on the materials through the elastic or electrical fields that accompany them. I will show a few examples in which such "perfect waves", for example, can be used to study and modify the dynamic conductivity of quantum structures and to actively program and influence photonic components.
Finally, it is also possible to use the waves to manipulate liquids, "soft matter" and living cells on a chip. Some examples of such acoustically driven 'chip laboratories' and their fascinating applications will also be dealt with in the lecture.