

## IRTG-Seminar



### Christiane Koch

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#### “Controlling cold and ultracold collisions”

Atomic and molecular collisions at very low energy are dominated by quantum effects. This makes them particularly susceptible to control. First, there will be a discussion how the internal rotational state of a molecule critically affects the outcome of cold reactive collisions. Notably, the anisotropic part of the interparticle interaction in the collision can be unravelled by controlling the internal molecular rotation. Then, there will be a focus on non-resonant light control of ultracold collisions. Non-resonant light universally couples to any polarizable object, independent of the particular energy level structure, frequency of the light (as long as it is non-resonant), or presence of a permanent dipole moment. It will be shown how non-resonant light can be employed to shift the position of shape resonances, induce Feshbach resonances and engineer them in their position and width. Non-resonant light control thus facilitates photo- and magneto-association of molecules that would otherwise be very hard to produce.

**Tuesday, April 26<sup>th</sup>, 2016, 4:00 p.m., HS II,  
Physik-Hochhaus, Hermann-Herder-Str. 3**