



**1<sup>st</sup> December 2010 - 10:00**  
**Building 49, Seminar Room (108)**

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## **Terry Mullins**

Physikalisches Institut, Albert-Ludwigs-Universität Freiburg

### **High-resolution optical pulse shaping and its application to the photoassociation of ultracold Rb atoms**

The creation of ultracold molecules has been an active area of research over the last few years. Among the methods for producing ultracold molecules is the photoassociation of ultracold atoms that have been cooled, for example, in a magneto optical trap. This has already been demonstrated with cw laser light, however a novel approach is to use shaped ultrashort laser pulses with which the process can be coherently controlled. I will present experiments that investigate this process with shaped femtosecond pulses and ultracold Rb atoms, in which both photoassociation as well as coherent electronic dynamics were observed. The experiments indicate that longer, picosecond-length, pulses are more suitable for controlled photoassociation. A new pulse-shaper design having unparalleled spectral resolution was implemented and is suitable for shaping picosecond-length pulses for such an experiment.