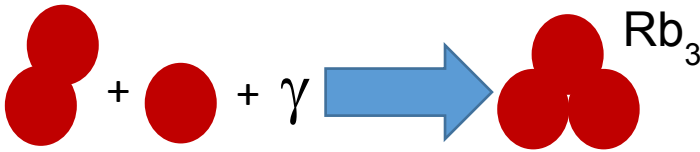


<b>Quantum control in the synthesis of ultracold polyatomic molecules   2AGS</b>		<b>Start date: 1. 3. 2017</b>
<b>PhD:</b> Simon Rupp (Ulm)	<b>PIs:</b> Prof. Johannes Hecker Denschlag (Ulm) Prof. Roman Krens (UBC)	
<p><b>Abstract:</b> The goal of this project is the synthesis of ultracold polyatomic molecules, i.e. molecule consisting of three or more molecules. We propose to take first steps in this direction, theoretically and experimentally. Concretely, we envisage photoassociation of an ultracold Rb<sub>2</sub> dimer with a Rb atom to form a Rb<sub>3</sub> molecule in a well-defined quantum state. Once produced, the trimer is detected via photoionization. The experiments will take place in our cold atom lab in Ulm where we can routinely produce ultracold atom-molecule mixtures. In order to guide the experiments, complex calculations on molecular trimer states and their dipole matrix elements will be done at UBC, Vancouver. The two groups will work together via email and skype but also via extended stays in Ulm and Vancouver.</p> <div style="text-align: center;">  <p>The diagram shows a chemical reaction where a diatomic molecule (two red spheres) and a single atom (one red sphere) react in the presence of a photon (gamma) to form a triatomic molecule (three red spheres). A blue arrow points from the reactants to the product, which is labeled Rb<sub>3</sub>.</p> </div>		
<p><b>Recent results:</b></p> <ul style="list-style-type: none"> <li>• 1 day meeting on 8. July 2017 in Ulm (R. Krens, M. Tomza, J. Hecker Denschlag, M. Deiss) discussing progress in the calculations of photoassociations schemes</li> <li>• Mid of August 2017 meeting in Vancouver (R. Krens, J. Hecker Denschlag) continuation of discussions</li> </ul>	<p><b>Publications:</b></p>	
<p><b>Further Collaborators:</b> Prof. Dr. Michal Tomza, Prof. Dr. A. Köhn, Dr. Tobias Kampschulte, Dr. Olivier Dulieu, Dr. M. Deiss</p>		