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### **Coherent Control of Ultracold Molecules**

While ultracold matter brought quantum effects onto the macroscopic scale, ultrafast lasers made quantum dynamical phenomena observable in real-time. Bringing the two together seems natural and holds the promise of employing quantum interferences in an unprecedented way. Photoassociation provides an optimal framework for the merger since in principle it relies only on the presence of optical transitions. Combining it with coherent control where the potential energy surfaces governing the dynamics can be 'shaped', a general route toward stable ultracold molecules is paved. The talk will introduce intuitive photoassociation schemes and discuss how various concepts of coherent control may be employed to improve the overall molecule yield as well as the final state control.



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