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Quantum engineering and chemistry with ultracold molecules

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Polar molecules possess rich internal degrees of freedom and intrinsic dipolar interactions. These properties make them prime building blocks for quantum engineering. Furthermore, molecules can undergo chemical reactions to transform between species. By cooling molecules to ultracold temperatures and controlling all of their quantum degrees of freedom, we are interested to provide a detailed microscopic picture of chemical reaction and to harness the molecular resources for quantum simulations broadly defined. I will introduce techniques that our field developed in the last 15 years to tame molecules with a focus on optical tweezer assembling of molecules.