

WATCHING CHEMICAL REACTIONS HAPPEN ONE MOLECULE AT A TIME

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Control over the quantum states of atoms and molecules can lead to a fundamentally new understanding of how these particles interact and react. This knowledge has the potential to impact our ability to probe processes in planetary atmospheres and in the interstellar medium.

Experimental techniques developed for control and measurement of atoms are now being used to study more and more complex molecules. We study these rich systems at low temperatures, where we can trap and examine their properties for many minutes, as compared to small fractions of a second in standard experiments. Using these cold, trapped molecular ions, we investigate mechanisms of ion-molecule reactions to gain insights into the mechanisms driving these processes.