Ultracold atomic and molecular gases

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Within this lecture, I will give an overview on recent experiments with ultracold polar molecules. The study of ultracold molecules promises important prospects such as quantum control of chemical reactions, novel methods for quantum information processing and the preparation and study of novel dipolar quantum states of matter.

Within the first lecture, I will give an overview on experimental techniques for the preparation of cold and ultracold molecular samples. In the second lecture, I will then review experiments on quantum state and interaction controlled chemical reactions in the limit of zero temperature making use of ultracold polar molecular samples.
We will accompany the lecture by a "journal club".