

Laser cooled molecules and their applications to fundamental physics

Mike Tarbutt

Centre for Cold Matter, Department of Physics, Imperial College London, London UK.

Several molecular species have been cooled to ultracold temperatures by direct laser cooling, and many more are amenable to this technique. I will explain how laser cooling is applied to molecules and present recent advances in cooling, trapping and coherently controlling them. Ultracold molecules could be used to improve the precision of measurements that test fundamental physics. For example, the electron's electric dipole moment could be measured with exquisite precision using laser-cooled polar molecules in a fountain or an optical lattice. I will present our efforts in this direction.