

Comprehensive Control of Atomic Motion

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Abstract

The method of laser cooling has opened the door to low temperature physics of dilute gases. Despite the great success of this method, it has been limited to a very small set of atoms in the periodic table and no molecules. I will describe in this talk new approaches to trapping and cooling that have been developed in my group [1]. The first step uses pulsed magnetic fields to stop atoms and molecules where they can be magnetically trapped. The next step is an experimental realization of informational cooling as first proposed by Leo Szilard in 1929 in an effort to resolve the paradox of Maxwell's demon. Together, these provide a two-step comprehensive solution to trapping and cooling. I will describe the projected impact of this work on physics, chemistry, and technology.

References

- [1] M. G. Raizen, Science **324**, 1403 (2009)