

# Machine Learning Applied to Laser Cooling

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Laser-cooled samples have been around for decades and have helped to produce great science contributions. More recently, machine learning has evolved a lot and has become an efficient means to investigate empirical models of complex systems. Typically, the complex dynamics presented by many-body interaction systems preclude precise analytical optimization of cooling mechanisms and capture. In this project, we will apply fundamental machine learning methods to optimize the preparation of neutral 87Rb atoms. The solutions found by machine learning tend to be radically different from the adiabatic, analytic solutions currently used by researchers and will be studied and compared. Despite this, we believe that the new solutions will overcome the combination of previously known parameters optimizing the preparation of highly dense and cold neutral trapped atomic samples.