

Abstract Submitted  
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**Construction and Implementation of a Low-Cost Rubidium Magneto-Optical Trap**<sup>1</sup> JUDITH OLSON, Ithaca College — A low-cost magneto-optical trap (MOT) for ultra-cold atoms is a wonderful tool for undergraduate research and teaching laboratories that highlights many topics in modern physics. We researched and created such a MOT using two external-cavity diode lasers, two laser locking systems, optics, magnetic coils, and Rubidium vapor cells. At our undergraduate institution, we chose a combination of equipment that we fabricated ourselves together with some purchased items as an optimum balance between cost and building time. However, an emphasis was placed upon self-construction of components, such as machining the laser cavities and constructing the majority of the circuitry within the institution. The total cost of our MOT was about \$25,000. We were successfully able to trap more than 10 million Rubidium atoms in 1 cubic centimeter. Such a MOT is a feasible addition to any undergraduate course of study. The theory of operation and construction methods of our MOT will be presented along with our first measurement results.

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