

# Dressing Ultra-Cold Atoms for Rings and Shells

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We start with a brief introduction on how to use the radio-frequency dressing to generate traps and waveguides for ultra-cold atoms in different topologies [1]. Ring systems have applications to Sagnac interferometry, but we will also include shells and toroidal surfaces. The full exploration of a large shell, to produce a bubble of matter-waves or BEC, has to be performed in free-fall, i.e. in space or a drop-tower. We will show how NASA's BEC experiment in orbit (the Cold Atom laboratory [2]) can be enhanced to produce improved shell potentials. This is done using both rf-dressing for the shell potential and microwave interactions for tuning it [3]. Diagnostic information is analysed with the free-expansion of shells and we also discuss applications to ring structures [4].

## References

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