

# Joint CQSE and CASTS Seminar

Weekly Seminar  
Oct. 17, 2014 (Friday)

TIME Oct. 17, 14:30 ~ 15:30  
TITLE Characterizing the Haldane phase in spin-1 Heisenberg  
antiferromagnets  
SPEAKER Dr. Keola Wierschem  
Department of Physics, National Taiwan University  
PLACE Rm716, CCMS & New Physics Building, NTU

## Abstract

Over thirty years ago, Haldane conjectured that the ground state of the spin- $S$  Heisenberg antiferromagnet chain has gapless excitations for  $S$  a half-odd integer, whereas for integer  $S$  the ground state is separated from all excited states by a finite spin gap. This was quickly confirmed for the case of  $S=1$  by numerical studies and the discovery of several quasi-one-dimensional spin-1 quantum magnets exhibiting a spin gap (the so-called Haldane gap materials). In this talk, we review the properties of the Haldane phase in quasi-one-dimensional systems of weakly coupled spin-1 Heisenberg antiferromagnetic chains. We then discuss the implications for this phase in light of a new classification scheme for symmetric phases of matter -- the symmetry-protected topological states.

