

THE UNIVERSITY OF HONG KONG
COLLOQUIUM SERIES IN PHYSICS DEPARTMENT

**When bosons meet spin-orbit coupling:
to condense or not?**

Dr. Qi Zhou

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Time: Thursday, November 29, 2012, 4:30 p.m.

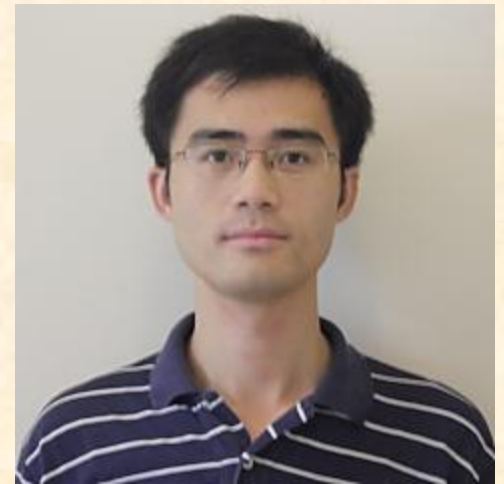
**Venue: Lecture Theatre P2, Chong Yuet Ming Physics Building,
The University of Hong Kong**

Abstract:

The recent realization of synthetic gauge fields for ultra cold atoms provides physicists exciting opportunities to investigate the interplay between two fundamental phenomena in nature, Bose-Einstein condensation and spin-orbit coupling. Intensive theoretical studies have predicted a variety of novel macroscopic quantum phenomena of spin-orbit coupled condensates. Meanwhile, a straightforward observation tells one an unambiguous conclusion that some types of spin-orbit coupling completely destroy a three-dimensional condensate even at sufficiently low temperatures. Therefore, fundamental questions on whether and when a condensate exists in the presence of spin-orbit coupling arise. In this talk, I will discuss how the competition among interaction, Bose statistics, and anisotropy of spin-orbit coupling determines the fate of a condensate. Particularly, the divergent thermal depletion for isotropic spin-orbit coupling and spin-independent interaction suggests an interesting routine to suppress the long-range order in weakly interacting atomic systems via spin-orbit coupling.

About the Speaker:

Dr. Zhou received his Ph.D. from The Ohio State University in 2009, and B.S. from Tsinghua University in 2003. After working as a postdoctoral fellow at Joint Quantum Institute at University of Maryland, he joined The Chinese University of Hong Kong in 2011. His research focuses on many-body effects in quantum gases, including ultra cold atoms in synthetic gauge fields, macroscopic quantum phenomena in atomic mixtures, strongly correlated systems in optical lattices, and few- and many-body problems of strongly interacting atoms.



Physics colloquium series is organized to introduce cutting edge researches and new development in physics, designed to be suitable to graduate and undergraduate students, and also to scientists working on different fields. Each colloquium will generally start with an extensive introduction of the background of the field, followed by forefront research topics and results. The colloquium will serve as an education forum for students and laymen alike, and also serve as a platform for exchange and update their knowledge of various branches of physics among academic staff members.

Coffee and tea will be served 20 minutes prior to the colloquium
Anyone interested is welcome to attend

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