



# 复旦大学物理系 Colloquium

Time: 14:00, Tuesday, 2022.11.29

Location: C108, Jiangwan Physics Building

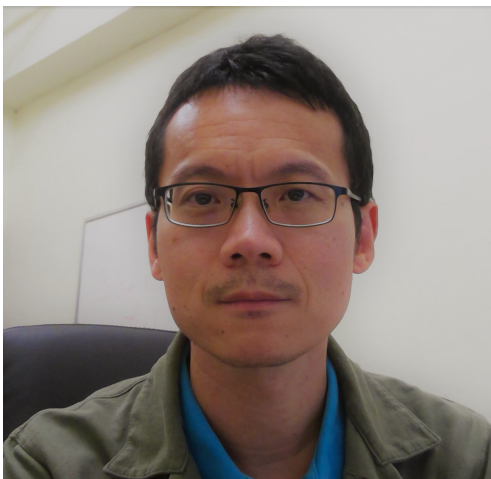
Tencent Meeting ID: 555-1423-1738, Password: 2005

## Quantum droplet and quantum bubble in ultracold Bose-Bose mixtures

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**Abstract:** The two-species Bose-Einstein condensate (BEC) of ultracold dilute atomic gases has been a quantum system with long-lasting interests. In recent years, many previously unexplored phenomena in this system have been observed by manipulating the interplay between the inter- and intra-species interactions. In this talk, I will present two experiments carried out with the double BEC of sodium and rubidium atoms. With the help of a Feshbach resonance, we tune the inter-species interaction to attractive enough so that the system should collapse in the mean-field regime. Instead, we observe the formation of a stable liquid droplet of the two species due to the beyond mean-field Lee-Huang-Yang correction. On the other hand, the large positive inter-species interaction near zero magnetic fields drives the system into the phase-separated phase. In this case, the Na BEC forms a closed shell surrounding the Rb BEC. After removing the rubidium atoms, we obtain a hollow bubble BEC which interferes with itself during free expansion. Some possible future investigations will also be discussed.



**Biography:** WANG Dajun is a professor at the department of physics of the Chinese University of Hong Kong. He received his Ph.D. in physics from University of Connecticut in 2007. Before joining CUHK in 2010, he was a postdoc at JILA, University of Colorado. His research focuses on developing the new quantum simulation platform with ultracold polar molecules and novel quantum phases in ultracold atomic mixtures.