

# CS Seminar

## ***Quantum Information seminar series - Enhancing the accuracy of timekeeping using quantum technologies***

**Dr Yuxiang Yang**  
**Institute for Theoretical Physics**  
**ETH Zurich**

**Date:**

**November 22, 2018**  
**Thursday**  
**2:30 pm**

**Venue:**

**Room 308**  
**Chow Yei Ching Building**  
**The University of Hong Kong**

**Abstract:**

Timekeeping plays a crucial role in navigating the world around us. Any device that produces time information, ranging from a simple pendulum to the most sophisticated atomic clock, is subject to a fundamental accuracy limit set by the laws of quantum mechanics. Pushing the precision of timekeeping towards the ultimate limit is crucial for applications like GPS, where even the tiniest errors matter. In this talk, I will show how to increase the accuracy of timekeepers using quantum technologies. I will discuss two different types of timekeepers: clocks, which produce ticks regularly, and stopwatches, which records the duration of several events. When supplied with additional quantum systems, both types of timekeepers can be made more accurate. This improvement leads to a performance that is not achievable if the supplied systems are classical. This result manifests an advantage of employing quantumness in timekeeping tasks.

**About the Speaker:**

Yuxiang Yang is a postdoctoral fellow at the Institute for Theoretical Physics, ETH Zurich. He holds a PhD in Computer Science from The University of Hong Kong and a BS in Physics from Tsinghua University. In 2017 he was awarded a Microsoft Research Asia Fellowship for his work in quantum information theory. His research aims to identify quantum advantages in communication and computation, and to design optimal protocols for the next generation of quantum computing devices.

**All are welcome!**  
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