Quantum Information Seminar

Memory effects in quantum metrology

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Date:
May 31 2019
Friday
2:00-3:00pm

Venue:
Room 308
Chow Yei Ching Building
The University of Hong Kong

Abstract:

Quantum metrology concerns estimating a parameter from multiple identical uses of a quantum channel. We extend quantum metrology beyond this standard setting and consider estimation of a physical process with quantum memory, here referred to as a parametrized quantum comb. We present a theoretic framework of metrology of quantum combs, and derive a general upper bound of the comb quantum Fisher information. The bound can be operationally interpreted as the quantum Fisher information of a memoryless channel times a dimensional factor. We then show an example where the bound can be attained up to a factor of two. With the example and the bound, we show that memory in quantum sensors plays an even more crucial role in the estimation of combs than in the standard setting of quantum metrology.

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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