



東京大学大学院理学系研究科・理学部

物理学教室 談話会

第七回 仁科アジア賞受賞

Prof. Chao-Yang Lu

(University of Science and Technology of China, Hefei, P.R. China)

「Scalable photonic quantum technologies」

2019年12月13(金) 15時00分～16時30分

理学部4号館1220号室

The main challenge for large-scale photonic quantum technology lies in the lack of a perfect single-photon sources. In this talk, I will report recent progress towards developing highperformance quantum light sources. Using parametric down-conversion, we produce two-photon source with simultaneously a collection efficiency of 97% and an indistinguishability of 96% between independent photons. Using a quantum dot-micropillar, we produced single photons with high purity ($>99\%$), near-unity indistinguishability for >1000 photons, and high extraction efficiency—all combined in a single device compatibly and simultaneously. We developed bichromatic laser excitation [Nature Physics, 2019] and elliptical microcavities [Nature Photonics, 2019] to overcome the polarization filtering to create truly optimal single photon sources. The highest-quality single photons allowed us to perform quantum interference with sunlight with 80% raw visibility [PRL 2019]. We report boson sampling with 20 single photons injecting into 60-mode interferometer at a state space of 10^{14} [16].

※ 午後2時半過ぎから1220号室の前にお茶とお菓子を用意しています。
どうぞご利用ください。