# Direct transfer of light's orbital angular momentum onto a nonresonantly excited polariton superfluid

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An exciton-polariton (polariton) is a Bosonic quasiparticle formed through the strong coupling of an exciton and a photon. It can condense into a coherent ground state which behaves like a superfluid in many ways. It is an inherently driven-dissipative superfluid due to the presence of pumping and leakage. Therefore, formation of both the condensate itself and quantized vortices of the condensate has been a subject of intense research. In this experiment, we present a relatively simple method to create quantized vortices in the polariton condensate with a non-resonat Lagurre-Gaussian (LG) beam. We found that the chirality of the polariton vortex mostly depends on the orbital angular momentum of the pumping beam. [1]

No fine tuning of other parameters such as the laser beam's intensity, energy, momentum, size or shape is required Polariton condensates angular momentum follows the incident beam's angular momentum both in direction and magnitude indicating some form of angular momentum transfer occurring from the beam to the condensate. In other words, there is a one to one correspondence between the photon's angular momentum to polariton's angular momentum and photonic control of polariton's topological charge is possible. [1]

**References**

[1] Min-Sik Kwon, Byoung Yong Oh, Su-Hyun Gong, Je-Hyung Kim, Hang Kyu Kang, Sooseok Kang, Jin Dong Song, Hyoungsoon Choi, and Yong-Hoon Cho, *Physical Review Letters*, 2019, **122**, 045302