

P220a **Extended Tail Structure Associated with a Protoplanetary Disc around SU Aur**

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The Milky Way is likely teeming with free-floating planets because a quite number of the objects have been discovered since several young isolated planetary mass objects were first discovered in Orion and Chamaeleon molecular clouds. In fact, recent studies suggest that these objects might outnumber stars in our galaxy. Previous observations in optical and near infrared wavelengths found that an extended streamer-like structure was associated with the protoplanetary disc around a young T-Tauri star, SU Aur, indicating that substantial amount of mass transfer from the disc, which might be a clue for the origin of the isolated planetary mass objects. Here we report a newly discovered streamer-like structure of CO gas by the Atacama Large Millimeter/submillimeter Array (ALMA). As results of geometric-kinematic structure analysis and theoretical perspectives, both of the disc and streamer components physically connects each other. Numerical hydrodynamics simulation found that several possible scenarios could explain the observed structure, 1) collision with a (sub-)stellar intruder or a gaseous blob, 2) gas stream from the ambient molecular cloud, and 3) ejection of a planetary or brown dwarf mass object due to gravitational instability via multi-body gravitational interaction. These mechanisms can lead a step towards unveiling the long-standing mystery of the origin of free-floating planet and brown dwarf.