**Seminar**

by

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**Monday, 07 October 2019, at 15:00 Uhr in HS**

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**Disentangling galaxy formation history through a (population)-orbit superposition model**

Stellar kinematics is a fossil record of galaxy formation and evolution. In particular, the fraction of stars on near-circular orbits compared to the fraction of stars on kinematically hotter and geometrically rounder orbits, speaks directly to the slowly accretion of gas flow or violent merging/feedback of the galaxies' past. On the other hand, stellar chemistry is conserved, thus a timing clock of a galaxy's formation. The combination of stellar kinematics and stellar chemistry may provide us unprecedented information to understand the formation of galactic structures. The IFU surveys, like CALIFA, MaNGA, SAMI, provide us information integrated along the line-of-sight, including kinematic maps, mean age and metallicity maps.

Using the orbit-superposition Schwarzschild method, we have been able to derive the internal stellar orbit distribution for a sample of 300 CALIFA galaxies, which form an orbit-based 'dynamical Hubble sequence'. Decomposition of galaxies is thus possible based on their orbit distribution. We further developed a population-orbital model by tagging age and metallicities to the orbits in the Schwarzschild model. Which has been applied to FCC 167 with MUSE observations as a first case-study. Based on the model, we are able to present the formation history of different structures, e.g., thin disk, thick disk, bulge, in a quantitative way.

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