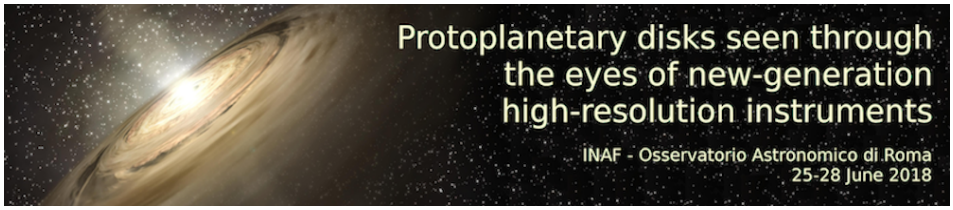

Contribution ID: **39** Type: **not specified**

Understanding the evolution of mass accretion to explain the evolution of disks (I)

Tuesday, 26 June 2018 09:30 (30 minutes)

Low-mass pre-main-sequence stars interact with their surrounding protoplanetary disks through accretion of material onto the star and emission of material through winds. These processes regulate the evolution of protoplanetary disks and thus their ability to form planets.

Star-disk interaction processes are best studied spectroscopically. Instruments like the VLT/X-Shooter spectrograph allow us to observe simultaneously the signatures of the accretion process, such as the UV-excess and the emission lines, together with lines tracing winds and outflows, such as helium lines and forbidden lines. At the same time, such spectra allow us to robustly derive the physical parameters of the central objects, such as their temperature and their mass.

When this information is combined with observations of disks at sub-mm wavelengths with ALMA it is then possible to quantitatively constrain disk evolution mechanisms, and thus to define the physical conditions in which planets form.

I will report on the dependence of the mass accretion rate with stellar mass and disk mass for the complete samples of low-mass objects in the Lupus and Chamaeleon star-forming regions. I will show how the mass accretion rate scales with a steeper slope with the stellar mass for very low-mass stars with respect to solar mass stars, and how the mass accretion rate scales almost linearly with the disk mass in these young regions. I will report on the first results on these relations in the older Upper Scorpius region, and I will then discuss the theoretical framework we are working on to explain these observations.

Presenter: MANARA, Carlo Felice (ESO)

Session Classification: Disk accretion and star-disk interaction (chair B. Stelzer)