

SF2A Presentation Abstract:

AGB stars are among the most important dust factories of the Galaxy and an important source of heavy elements formation and spread into the Interstellar Medium. The dust formation and the mass-loss process are still poorly understood and constrained. To improve our understanding and apply a strong constraint on the mechanisms that enter the game, we need to have a closer look on the surface and into the very first layer of evolved stars where the dust building blocks, and the molecules start to form. Recent VLT/MATISSE observations and image reconstructions of the S-type star Pi.01 Gru in L-band revealed the presence of complex atmospheric structures as well as on its surface. Images in the continuum, SiO (3-1), SiO (4-2), OH (2-1) and SIO (5-3) and opacity maps of the environment at each molecular spectral features revealed non-homogenous molecular formation around the star with clumpy structures. In N-band we observe silicates signature and interesting features linked to the interaction between the binary companion and the main central AGB star with possible mass-transfer between the two.

Images show also the presence of complex structure near the stellar surface and in the close environment of the star. In addition, thanks to the combination of opacity maps and image reconstruction, dense material is also detected at roughly all the spectral wavelengths windows. In this presentation we synthesize our main results and the conclusions of those fresh discoveries.