

High Angular Resolution Mid-IR Astronomy at Concordia

Marco Ferrari-Toniolo

C.N.R. - Istituto Astrofisica Spaziale e Fisica Cosmica (IASF)

If we concentrate our attention on the study and the evolution of star forming processes rather than on the Universe Global Structure, from the recent use of new Large Telescopes in this context we begin to have many examples of great interest and prospects, linked to the study of the early phases of aggregation of matter (stellar and planet formation), and to the late phases of disgregation along the stellar evolution. In Fig.1 a spectacular example is shown of a high resolution image of an edge-on circumstellar disk of a young star (HR4796A), with respect to previous less resolved information. (C.Telesco et al,ProcSPIE4834,101,2002). A recent hypothesis of a Large Infrared Telescope called GTA (Grande Telescopio Antartico) has been proposed to the PNRA (Italian Plan for Antarctic Researches), which will respond to the following characteristics: high angular resolution in the mid-ir domain (large aperture); very high sensitivity (mainly due to the exceptionality of the site); extreme simplicity in the design and in the operational modes in order to face the extreme operating situation. The Telescope will be a Survey instrument and will be used almost without human intervention. The project examines the construction of a third tower at Dome C with the telescope configured to work in quasi-drift-scan without moving the enclosure and with a limited tracking time. In Fig.1 a sketch of the tower hosting the Telescope is shown. (M.F.T.et al,ProcSPIE4836,165,2002). A study will be developed to adopt different optimized configurations for observing in different bands, from the optical to the sub-mm range, with a refurbishment of the telescope and instrumentation during the summer break.

We expect to have a great advantage in sensitivity from the GTA with respect to the new class of Large Telescopes operating in a regime of almost same angular resolution; a more detailed study can be accomplished by the large "temperate" Telescopes by using more sophisticated instrumentation (spectrometers, polarimeters, coronagraphs etc.). Even more interesting could be the use of GTA in conjunction with the LBT or the other growing facilities for ground-based interferometry, or with respect to the ultra high sensitivity images expected from the future ir space missions: the GTA data will be of great help for addressing and analyzing both the space and the interferometric data. The GTA seems to be also an unavoidable step for the future ELT's Projects.

