

Name of research institute or organization:

CNR, Istituto di Radioastronomia, sezione di Firenze

Title of project:

Italian national infrared telescope TIRGO

Project leader and team

Prof. Gianni Tofani, director of the institute
Dott. Enzo Natale, director of the department
Dott. Filippo Mannucci, TIRGO supervisor

Project description:

The TIRGO telescope is an Italian national facility for infrared observations. In the near-infrared wavelength range (1-2.5micron) both images and spectra can be obtained by the camera ARNICA, while the camera TIRCAM2 allows observations in the mid-IR regime (3-20 micron).

During 2003 TIRGO activity was focused on observing galaxies in the local universe to address the issue of galaxy formation. The traditional picture is that their central region, the "bulge", formed early well before the disk in a so-called "monolithic collapse". Recently, it has been suggested that bulges could instead be formed after the disk, as an evolutionary phenomenon in which the central parts of the disk alter their shape and dynamics and become bulges. Several physical mechanisms have been proposed as the driver for such evolution.

The near-infrared images of a large sample on galaxies acquired at TIRGO were decomposed (see Hunt, L.K., Pierini, D., & Giovanardi, C. 2004, A&A, in press) to homogeneously derive the properties of their disks and bulges. The statistical analysis of the data suggests that indeed there is a strict link between the properties of a bulge and those of its host disk. The link is stronger in galaxies with small bulges and degrades continuously as the bulge gets larger. All this fits nicely within the evolutionary scenario and is in contrast with the "monolithic" hypothesis.

Key words:

infrared astronomy, infrared instrumentation

Internet data bases:

<http://www.arcetri.astro.it/irlab/tirgo>: TIRGO web pages
<http://tirgo.arcetri.astro.it>: publicly accessible archive of all the data taken at the TIRGO telescope

Collaborating partners/networks:

several italian institutions are collaborating with IRA in the development of new instruments: among the others, the Turin Astronomical Observatory and two institutes of the CNR located in Rome, IAS and IFSI.

Scientific publications and public outreach 2003:

Refereed journal articles

Gavazzi G., Boselli A., Donati A., Franzetti P., Scodreggio M., "Introducing GOLDMine: A new Galaxy Database on the WEB", 2003, A&A, **400**, 451
Boselli A., Gavazzi G., Sanvito G., "UV to radio centimetric spectral energy distributions of optically-selected late-type galaxies in the Virgo cluster", 2003, A&A, **402**, 37

Lara, L.M., Licandro, J., Tozzi, G.P. *Dust in Comet McNaught-Hartley (C/1999 T1) from Jan 25 to Feb. 04, 2001: IR and Optical Imaging* A&A, **404**, 373 .

Richichi, A.; Calamai, "Infrared high angular resolution measurements of stellar sources. VI. Accurate angular diameters of X Cnc, U Ori and Eta Gem." 2003, A&A **399**, 275

Conference papers

Baffa, C "The Fasti Project" 2003, IV Convegno Nazionale di Astronomia Infrarossa, Perugia, Dicembre 2001. MemSait **74**, 165

Corcione, L.; Busso, M.; Porcu, F.; Ferrari-Toniolo, M.; Persi, P. "Control system architecture for mid-infrared cameras: from TIRCAM2 to IRAIT" 2003, IV Convegno Nazionale di Astronomia Infrarossa, Perugia, Dicembre 2001. MemSait **74**, 57

Corti, G.; Risso, S.; Busso, M.; Silvestro, G.; Corcione, L. "Infrared investigation from earth and space on the evolutionary state of a sample of LPV" 2003, IV Convegno Nazionale di Astronomia Infrarossa, Perugia, Dicembre 2001. MemSait **74**, 205

Gavazzi G., "Estimating the mass of local galaxies from the NIR luminosity" Proc. conf. "The mass of galaxies at Low and high redshift", A. Renzini ed. 2003, Proceedings of the ESO Workshop held in Venice, Italy, 24-26 October 2001, p. 39

Mannucci, F. "Twenty year of TIRGO telescope" IV Convegno Nazionale di Astronomia Infrarossa, Perugia, Dicembre 2001, 2003, Mem. SAI, **74**, 101

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