CATALOGUE OF H I MAPS IN GALAXIES AND THE ANALYSIS OF THE DATA

María Cristina Martín[1]

A catalogue of maps of H I distribution in galaxies published in major journals is presented. For each galaxy the sensitivity of the observation, the spatial resolution (with the used telescope), the hydrogen mass obtained by the map, and a measure of the H I extension is given. This catalogue is a guide of all the H I maps published up to 1993. Some of the catalogued maps were analyzed according to a simple model of an overall gaussian distribution of the gas, in order to get an approach to the value of the real extension of the gas. Then, we have obtained new results in the sense that the galaxies optically smaller, are those which have greater relative extensions of the gas. Besides we have found an expression that relates the extension of the gas and the apparent H I surface density, that depends only on the integrated emission of the gas. According to our results, there does not seem to be any dependence of the relative extension of the gas with the morphological type. On the other hand, for spiral and irregular galaxies, the real H I surface density exhibits a broad range of values, while for elliptical and S0 galaxies the values are lower.

[1]Instituto Argentino de Radioastronomía, Argentina

STRUCTURE, VELOCITY FIELD AND TURBULENCE IN NGC 604

G.A. Medina Tanco[1], N. Sabalisck[1]
V. Jatenco-Pereira [1], and R. Opher[1]

The Hα intensity peak, velocity shift and velocity dispersion maps of the giant H II region NGC 604 in M33, obtained by two dimensional high spatial resolution Fabry-Perot observations with TAURUS II at the 4.2-m William Herschel Telescope in Spain (Sabalisck 1995), are analyzed via two point correlation functions. The whole system seems to rotate as a rigid body on scales from 50 to 80 pc (the largest scale studied), with a period of 85 Myr. We demonstrate that the cloud seems to comprise eddies with varying characteristic scale lengths which range from 10 pc to the largest scales observed. This may be a manifestation of a double cascading spectrum of forced two-dimensional turbulence, as the calculated kinetic energy spectrum seems to indicate. According to this interpretation, turbulence is being forced at scales of 10 pc, an entropy cascade has developed down to the smallest scales resolved and an inverse kinetic energy cascade extends up to scales of 70 pc where a low wave number turn over is observed. This is the first time that this phenomenon has been observed outside the terrestrial environment (i.e., atmosphere-magnetosphere of the Earth). We find, according to this model, that the largest scale of the inverse energy cascade evolves as $(l/\mathrm{pc}) \sim 60 \times (t/\mathrm{Myr})^{3/2}$.

[1]Instituto Astronômico e Geofísico, USP, Brazil

STAR FORMATION IN INTERACTING GALAXIES

Duília F. de Mello[1], Jack W. Sulentic[2], and
Ronaldo E. de Souza[3]

If environment plays a major role in galaxy formation, in pairs of galaxies one should expect to find galaxies of similar morphology. However, morphological studies of paired galaxies show two different categories: pairs formed by galaxies with similar morphology (EE and SS) and pairs of mixed morphology (ES), where E represents early-type galaxies and S represents late-types. Actually, a significant percentage of pairs in reasonably complete samples of binary galaxies (e.g., Catalog of Isolated Pairs of Galaxies by Karachentsev) are of mixed type.

We used imaging, spectroscopy and stellar population synthesis to study the interaction effects in 5 mixed pairs of galaxies (AM0327-285, AM1806-852, AM1907-504, AM2016-330, AM2055-492). The present pair sample originated from a sample of 126 candidate mixed pairs that were found during a visual search on the ESO sky surveys. AM1907-504, is unlikely to be a physical pair because of the large velocity difference. The other 4 pairs are most likely physically bound with $\Delta V \leq 600$ km s^{-1}. They can also be classified as true ES pairs since the photometric profiles for the early-type components obey an $r^{1/4}$ law. We find diverse signs of interaction in our pair sample ranging from direct collisions to small distortions. In principle, this evidence is less ambiguous in mixed pairs because we are dealing with a single gas rich component.

A strong but indirect form of evidence for interaction between the galaxies involves the detection of a young stellar component in the early-type members. We used Bica's stellar synthesis approach in order to detect the young stellar population in these pairs. We find that 10% to 37%

[1]CTIO, Chile - FAPESP Fellow

[2]University of Alabama, USA

[3]IAG-USP, Brazil