

## STAR FORMATION HISTORIES OF SPIRAL GALAXIES FROM A MULTI-WAVELENGTH STUDY

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We study the star formation histories of a sample of 113 nearby spiral galaxies using their radio continuum (20cm), FIR (40–120 $\mu$ m), H (1.65 $\mu$ m) and B (4400Å) luminosities. The first two are used as indicators of star formation rate over the past  $\sim 10^8$  years, as suggested by the tight and nearly universal FIR/radio correlation (Xu et al. 1994). Compared to other indicators of recent star formation rate such as H $\alpha$  and UV, FIR and radio continuum have the advantage of being insensitive to extinction. The B luminosity is taken as star formation indicator for the time scale of  $3 \cdot 10^9$  years, and the H luminosity for the time scale of  $10^{10}$  years. We find:

1. The long-term star-formation history (from a few billion years to the entire Hubble time), as indicated by the B-to-H luminosity ratio, depends strongly on the Hubble type.
2. The recent star-formation history in the last a few billion years, as indicated by the radio-to-B luminosity ratio and the FIR-to-B luminosity ratio, does not depend on the Hubble type.
3. Galaxies of a given Hubble type have similar long-term star-formation histories. On the other hand, their recent star-formation histories in the last a few billion years can be much different: the ratio between the star-formation rate averaged over the past  $10^8$  years to that over the past  $3 \cdot 10^9$  years can be different by two orders of magnitude, as indicated by the scattering of the radio-to-B luminosity ratio and that of the FIR-to-B luminosity ratio. This is not likely to be due to the extinction on the B luminosity, because the scattering of the B-to-H luminosity ratio for a given type is much smaller.

### References

Xu, C., Lisenfeld, U., Völk, H.J., Wunderlich, E. 1994, *A&A* 282, 19