

EVOLUTIONARY SPECTRAL SYNTHESIS AND THE UV UPTURN IN ELLIPTICAL GALAXIES

GLADIS MAGRIS C., and GUSTAVO BRUZUAL A.
Centro de Investigaciones de Astronomía, CIDA
Apdo. Postal 264 - Mérida 5101A - Venezuela

In this work we analyze the UV upturn seen in elliptical galaxies using the evolutionary spectral library of Bruzual & Charlot (1991). We present models for 3 representative groups galaxies of the Burstein *et al.* (1988) sample with different levels of UV flux.

The spectrum of NGC 4649 is modeled with a 14 Gyr old stellar population (consistent with the age determination by Bertelli, Chiosi & Bertola (1989)). The star formation rate (SFR) corresponds to an initial burst of 1 Gyr ($100 M_{\odot} \text{ yr}^{-1}$ in a $10^{11} M_{\odot}$ galaxy) plus a 'residual' continuum star formation of $0.03 M_{\odot} \text{ yr}^{-1}$. This comparison indicates that if we consider only *normal* Post Asymptotic Giant Branch (PAGB) stars, included in our library, we cannot reproduce the observed spectrum for this galaxy. Classical PAGB's contribute to the total luminosity only for $\lambda \leq 2200 \text{ \AA}$, and NGC 4649 has an excess of flux in the range 2200 - 2600 \AA (with respect to an old quiescent star system) which must be accounted for by a different stellar population. Other candidates have been explored by Greggio & Renzini (1990).

The spectrum of NGC 4472, with an intermediate value of the (1550-V) color, can be reproduced with an old population seen at 13.5 Gyr, which underwent a unique event of star formation, an initial burst of 1 Gyr of duration. The galaxies with this value of the (1550-V) color can be modeled by using only *normal* PAGB stars, resulting from the evolution of a quiescent stellar population.

For M32, the best model corresponds to a stellar system with a normal IMF that underwent two events of star formation: an initial 1 Gyr burst, and a second burst of the same duration at age 6 Gyr. This result, which agrees with O'Connell (1986), Bertelli, Chiosi & Bertola and others, has been questioned by Greggio & Renzini.

Our models are able to reproduce, in a consistent way, the observations of a large amount of quiescent E galaxies. The possibility of other evolved hot star candidates contributing to the UV flux is not excluded, but for many elliptical, the *normal* evolution of stars beyond the AGB is enough to account for their UV rising branch.

References

- Bertelli, G., Chiosi, C., and Bertola, F. 1989, *Ap. J.*, **339**, 889.
Bruzual A., G., and Charlot, S. 1991, *Ap. J.*, *Submitted*.
Burstein, D., Bertola, F., Buson, L. M., Faber, S. M., and Lauer, T. R. 1988, *Ap. J.* **328**, 440.
Greggio, L. y Renzini, A. 1990, *Ap. J.*, **364**, 35.
O'Connell, R. W. 1986, in *Stellar Populations*, ed. C. A. Norman, A. Renzini, y M. Tosi (Cambridge: Cambridge University Press), p.167.