RevMexAA (Serie de Conferencias), **16**, 255–256 (2003)

GALACTIC ASTRONOMY WITH OTELO

E. J. Alfaro,[1] J. Cepa,[2] J. Gallego,[3] I. González-Serrano,[4] J. González,[5] and M. Sánchez-Portal[6]

RESUMEN

OTELO (Osiris Tunable Emission Line Object survey) es un proyecto destinado al estudio del límite débil de la función de luminosidad de galaxias con líneas de emisión. También se llevará a cabo un mapa en banda ancha con límite de detección de $B = 24$ y área de alrededor de 14 grados cuadrados, lo que corresponde a un corrimiento al rojo más bajo seleccionado de $z = 0.08$. Esta enorme cantidad de datos contendrá información de alto valor sobre el contenido estelar de nuestra galaxia. En esta contribución revisamos diferentes proyectos galácticos en los que estos datos pueden proporcionar nuevas e importantes pistas acerca de cuestiones galácticas clásicas y nuevas.

ABSTRACT

OTELO (OSIRIS Tunable Emission Line Object survey) is a project aimed at studying the low end luminosity function of emission line galaxies. A broad band survey at $B \approx 24$ magnitudes detection level will also be performed for a field of view of about 14 square degrees corresponding to the lowest selected redshift ($z = 0.08$). This huge amount of data will contain invaluable information about the stellar content of a deep portion of our own Galaxy. In this contribution we revise different Galactic projects in which these data could provide new and important insights into classical and new Galactic questions.

Key Words: **GALAXIES : INTERACTIONS — GALAXY: STELLAR CONTENT — STARS: PECULIAR**

Science with the GTC 10-m Telescope (Granada, España, 5-8 febrero 2002)
Editors: José Miguel Rodríguez Espinosa, Francisco Garzón López & Verónica Melo Martín

1. INTRODUCTION

OTELO (OSIRIS Tunable Emission Line Object survey) is a key project mainly aimed at studying the low end luminosity function of emission line galaxies. The observational strategy is focused on tunable filter (TF) capabilities to separate and analyze spectral lines for an huge number of objects in a single image. An additional broad band (either $UBVIRZ$ or Sloan filters [TBD]) survey will be also accomplished for auxiliary objectives.

This survey will cover an area of 14 square degrees up to a limiting magnitude of $B =\sim 24$ providing a populous database, which will include galactic and even Solar System objects.

Here we propose possible scientific projects that could be performed with such a database. This list is not complete and is mainly aimed at encouraging the various scientific teams to participate in the exploitation of the OTELO heritage.

[1]Instituto de Astrofísica de Andalucía, CSIC, Granada, Spain.
[2]Instituto de Astrofísica de Canarias, La Laguna, Tenerife, Spain.
[3]Departamento de Astrofísica, UCM, Madrid, Spain.
[4]Instituto de Física de Cantabria, CSIC-UNICAN, Santander, Spain.
[5]Instituto de Astronomía, UNAM, México DF, Mexico.
[6]Univ. Pontificia de Madrid, Madrid, Spain.

1.1. *Halo structure and tidal tails*

Apart from the disk and central bulge of our Galaxy, there exists a low density stellar halo, which is almost spherical and has a spatial extent of several times the radius of the disk. This component is mainly populated by old, low-metallicity stars which are distributed either as field stars or as members of globular clusters. A group of dwarf satellite galaxies also orbit the Milky Way. Both globular clusters and dwarf galaxies contribute to the halo field stars by mass loss and disruption generated by the galactic tidal field.

Stars that have been tidally stripped from globular clusters or dwarf satellites are expected to orbit in more or less longlived streams. Several moving groups have been detected in the halo of our Galaxy that could be envisaged as the signature of recent strong mass loss or merging events. Another way to tackle halo structures and their origin is through the analysis of multicolor, wide field surveys with uniform coverage of dozens of square degrees (such as OTELO). The discovery of a tidal tail in the dwarf galaxy Ursa Minor has recently been reported by Martínez- Delgado et al. (2001).

The OTELO field location is still not defined although several selection criteria are contained in the OTELO definition document. Fields with a high probability of containing a tidal tail population which fulfill the general selection criteria could be studied and provide an interesting galactic by-product.

1.2. *Galactic model*

Since the pioneering star count analysis of Herschel, our knowledge of details of the structure of the Milky Way is based on star count data with color information. The discovery of the Galactic component named the thick disk (Gilmore 1984) is a good example of success in applying this technique.

This way of tackling the structure of the Milky Way is now entering a golden age with the advent of new surveys such as the Sloan Digital Sky Survey (Chen et al. 2001). OTELO, probing deeper ($B \approx 24$) in an area of about 14 square degrees, will provide an invaluable database for refining the present Galactic model before the *GAIA* mission.

1.3. *Peculiar stars*

Color phase space has for decades been an essential tool for analyzing the stellar content of galactic and extragalactic systems. Recent studies of the discriminatory power of various photometric systems (e.g.. Krisciunas, Margon, & Skody 1998) allow us to separate unusual stars with special spectroscopic features from normal objects.

Cataclysmic variables, carbon stars, BHB stars and RR Lyrae stars occupy different locations in a multidimensional color space based on the Sloan photometric bands.

Besides the broad band survey, the OTELO project is designed to obtain information in three more photometric bands centered on 715, 816, and 918 nm. The discriminatory power of color space can be increased in this way, especially for cold and low mass stars.

1.4. *Solar System objects*

With a suitable observational strategy, the OTELO survey will be able to detect objects with angular motions of $\approx$4 arsec hr^{-1}, which corresponds to the Earth's reflex motion for an object at the distance of Neptune and thus includes Kuiper Belt objects.

Recent studies (e.g., Ivezic et al. 2001) have shown the ability of the Sloan photometric system to separate between "red" and "blue "asteroids, associated with carbonaceous and silicate typesl and even to go further in the connection between asteroid colors and other physical properties.

EJA acknowledges partial support from the Spanish Ministerio de Ciencia y Tecnología through grant PB97-1438-C02-02 and from the Research and Education Council of the Autonomous Government of Andalucía (Spain).

REFERENCES

Chen, B., et al. 2001, ApJ, 553, 184
Gilmore, G. 1984, MNRAS, 207, 223
Ivezic, Z., et al. 2001 (astro-ph/0105511)
Krisciunas, K., Margon, B., Skody, P. 1998, PASP, 110, 1342
Martínez-Delgado, D., Alonso-García, J., Aparicio, A. 2001, ApJ, 549, L63