

# VERY LARGE TELESCOPES AND THE TOPOLOGY OF THE ISM

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## RESUMEN

Se presentan algunas ideas sobre las técnicas espectrofotométricas que deberían aplicarse al estudio de la estructura del medio interestelar con un gran telescopio.

## ABSTRACT

New spectrophotometric techniques that should be applied to the study of the interstellar medium structure with a large telescope are discussed.

*Key words:* **INSTRUMENTATION: SPECTROGRAPHS —  
TECHNIQUES: SPECTROSCOPIC — ISM: STRUCTURE**

## 1. SPECTROPHOTOMETRIC TECHNIQUES AND THE STRUCTURE OF THE ISM

The ionized fraction of the Interstellar Medium (ISM) exhibits very extended two-dimensional structures. Hence the wide application of scanning Fabry-Perot Spectrography (SFPS) to draw maps in the light of various emission lines, from around  $0.37 \mu\text{m}$  to at least  $2.4 \mu\text{m}$ , with the recent advances in large format IR detectors.

These structures do appear at all spatial scales, including the smallest presently accessible. For the study of the, frequently encountered, compact components ( $\leq 10$  arcsec) Integral Field Spectrography (IFS) could also play a significant role, in allowing the study of many emission lines at once. In addition, both SFPS and IFS, when coupled with an Adaptive Optics facility, will offer the new capability of sub-0.1 arcsec spectrography of even the smallest regions seen on *HST* images.

As the ISM is of course really three-dimensional, its velocity structure is finely delineated as well. Again, SFPS with spectral resolutions approaching  $10^5$  is the technique of choice. For regions with a strong stellar component (e.g., star formation complexes), coupling a scanning Fabry-Perot to an IFS will offer both the high spectral resolution and the large wavelength range needed, but on a small field only.

In the past, the spread of these "exotic" techniques has been severely hindered by the lack of professional-level software. It must absolutely be recognized that the development of such high performance, reliable, user-friendly, well documented data reduction package is essential and must be an integrated part of any instrument project, right from its start.