ALFALFA Survey of the Leo Region

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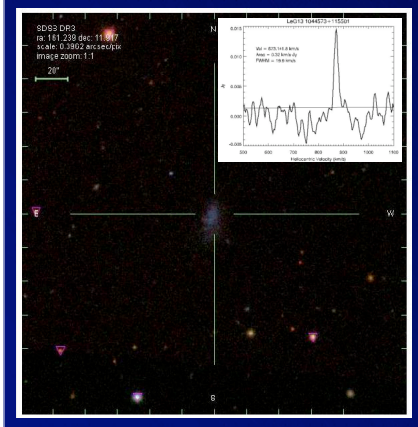
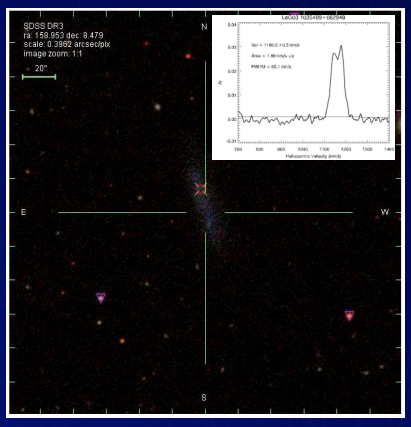
ABSTRACT: The Leo region offers a detailed view of several nearby groups of galaxies including Leo I at 10.4 Mpc and another slightly more distant structure within the Local Supercluster (Leo II). Leo I is of particular interest because it contains both a large ring of intergalactic gas of unknown origin (the Leo Ring) as well as a long tidal stream of stars and gas in the Leo Triplet. Because of its proximity, Leo can also offer insight into the nature of low-mass, low-surface brightness galaxies believed to be the building blocks of galaxy formation. A direct comparison of optically and HI selected samples of dwarf galaxy candidates in the region has been made. This work has been supported by NSF grants AST-0307661 and AST--0435697 & by the Brinson Foundation.

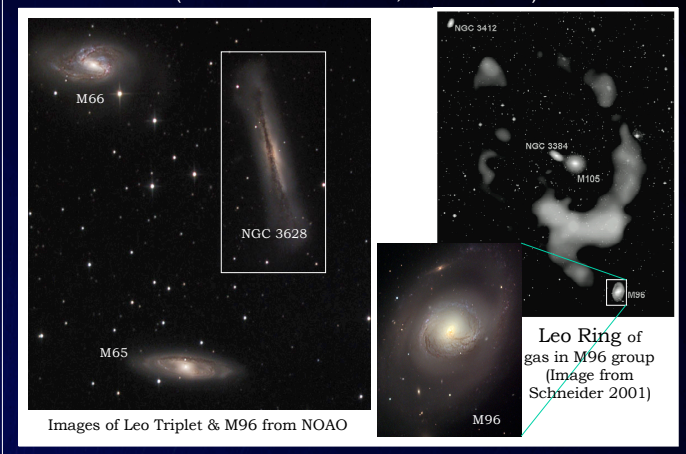
OPTICALLY-SELECTED SAMPLE: Dwarf galaxy candidates in the Leo region were optically selected via a visual inspection of POSS-II/ESO/Serc plates by Karachentsev and Karachentseva. Sensitive, targeted single-pixel Arecibo observations were taken of those candidates. Twenty-one of a possible thirty-five dwarf galaxies were detected in HI including five background sources.





HI-SELECTED SAMPLE: A catalog of HI line detections in the Leo region of the sky has been made using data from the blind HI survey ALFALFA which takes advantage of the new, multi-feed array on the 305-m Arecibo telescope. (See talk by Riccardo Giovanelli on Thurs at 10 for more on ALFALFA.) Coverage to date comes from 70 hours of observations in 120 square degrees within which six of the seven optically-selected dwarf galaxies have been detected in the blind survey. As you read this, the coverage in the Leo region is being improved and more data will be taken throughout the spring. Of particular interest are the HI detections which seem to have no optical counterparts like two of the clumps shown at right taken in the Leo Triplet.

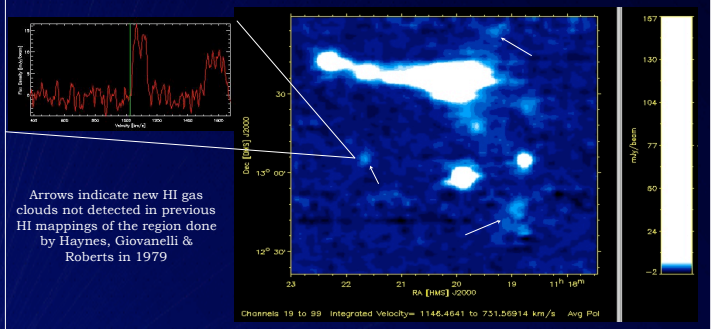
Points of Interest in the Leo Region
(10^h30^m<RA<11^h30^m, 8°<dec<16°)



Images of Leo Triplet & M96 from NOAO

Leo Ring of gas in M96 group (Image from Schneider 2001)

LEO TRIPLET: After 210 minutes of observations in the Leo Triplet region, 30 strong candidate HI detections have been found in a 4 square degree box around the trio of large galaxies. With further coverage from a second pass over the area of the sky, the sources of these detections will be investigated to determine whether they may be previously undiscovered dwarf galaxies or additions to the intergalactic gas clouds that serve as evidence of a possible prior galactic encounter.



Arrows indicate new HI gas clouds not detected in previous HI mappings of the region done by Haynes, Giovanelli & Roberts in 1979

References:
Thank you to SDSS & NOAO for the beautiful optical images.
Leo Group (Schneider 2001)
A Catalog of Neighboring Galaxies (Karachentsev & Karachentseva 2003)
Detailed Examination of the Neutral Hydrogen Dist. in the Leo Triplet (Haynes, Giovanelli & Roberts 1979)
Neutral Hydrogen in the M96 Group: Evidence for a Giant Intergalactic Ring (Schneider 1984)

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