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CLUSTERING IN THE GREAT ATTRACTOR REGION

R. C. Kraan-Korteweg[1], P. A. Woudt[2], S. A. W. Moore[3], J. Lucey[3], and M. Ochoa[1,4]

A large part of the Great Attractor (GA) region is hidden by the Milky Way. However, the mapping of structures in this region (clusters as well as voids) is important for the understanding of this massive overdensity and its dynamics. We discuss our observing program of the Norma cluster (ACO 3627), a rich cluster at the core of the GA, as well as first results from an *I*-band survey centered on PKS 1343−601, a strong, but heavily obscured radio continuum source that might constitute the center of yet another rich cluster in the GA region.

The Norma cluster: A deep optical galaxy search behind the Milky Way in the GA region (Woudt & Kraan-Korteweg 2001) and subsequent follow-up photometric and spectroscopic observations found the Norma cluster (ACO 3627) at $(\ell, b) = (325.3°, -7.2°)$ to be the nearest rich cluster in the local Universe. In the following we describe ongoing deeper studies of this dynamically interesting cluster at the heart of the GA. For results from earlier studies see Kraan-Korteweg et al. 1996, Woudt 1998, Woudt & Kraan-Korteweg 2000.

To retrieve the population of dwarf galaxies in the Norma cluster, we have obtained deep ($R_{\rm C} \lesssim 20$ mag) R-band CCD photometry of the entire cluster within its Abell radius, using the Wide Field Imager (WFI) on the la Silla 2.2-m telescope. A first analysis of these data resulted in the detection of 1011 new galaxies (with $D \geq 5''$). These galaxies build the basis for 2dF follow-up spectroscopy.

For the central $50' \times 50'$, additional near infrared photometry has been obtained with the Japanese 1.4-m Infrared Survey Facility (IRSF) at the South African Astronomical Observatory. The camera has the ability to take simultaneous J, H, and K' data with a field of view of $8' \times 8'$. The deep infrared data (down to $J \approx 15.5$ mag, and $K' \approx 14.5$ mag) will allow us to determine the luminosity function of the cluster in the infrared.

These photometric data combined with 2dF spectroscopy will allow a dynamical analysis of this cluster as well as an accurate distance determination to the Norma cluster through a Fundamental Plane analysis ($\sim$100 km s^{-1} or $\sim$ 2% at this distance). Such an accuracy will determine the position of the Norma cluster within the GA overdensity and test whether it is at rest with respect to the CMB.

An obscured cluster centered on PKS 1343−601? Is Norma the only massive cluster behind the Milky Way in the GA region? We suspect that the highly obscured ($A_{\rm B} = 12^{\rm m}$) radio galaxy PKS 1343−601 at $(\ell, b, V) = (309\overset{\circ}{.}7, +1\overset{\circ}{.}8, 3872\,{\rm km\,s^{-1}})$ might constitute the center of another cluster in this region (Woudt 1998, Kraan-Korteweg & Woudt 1999) but neither deep optical galaxy searches nor current NIR surveys do penetrate the ZOA at this location.

We have therefore imaged the core of this prospective cluster (about $2° \times 2°$) in the I-band in which extinction effects are less severe ($A_{\rm I} = 0.45 A_{\rm B}$) using the WFI of the 2.2-m telescope in la Silla. We were able to identify 49 certain and 6 uncertain galaxy candidates to extinction levels of $A_{\rm I} \lesssim 5\overset{\rm m}{.}0$. Although their distribution does not resemble a centrally condensed, massive cluster, its appearance is entirely consistent with a rich cluster hidden behind an increasingly thickening exinction layer. This could be demonstrated with simulations of how the Coma cluster would appear if it were observed with the same instrument and were centered in velocity space at the position of PKS 1343−601.

With T. Nagayama and S. Sato we have started imaging the core of this prospective cluster in the J, H and K' bands with IRSF to uncover further prospective cluster members and substantiate the reality of this cluster. First results are promising.

[1]Departamento de Astronomía, Universidad de Guanajuato, Apdo. Postal 144, Guanajuato GTO 36000, México (kraan@astro.ugto.mx).

[2]Department of Astronomy, University of Cape Town, Private Bag, Rondebosch 7700, South Africa (pwoudt@circinus.ast.uct.ac.za).

[3]Department of Physics, University of Durham, South Road, Durham, DH1 3LE, United Kingdom (S.A.W.Moore, john.lucey@durham.ac.uk).

[4]Instituto de Astronomía, UNAM, Apdo. Postal 70-264, México D.F. 04510, México (mochoa@astroscu.unam.mx).

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