A Rich, Nearby Galaxy Cluster in Sagittarius

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In a series of *ESO Messenger* and *Comptes Rendus* papers (1978 – 1985), Terzan, Bernard, and Ju discovered some 45 diffuse objects in the general direction of the Galactic Bulge, viz., Sagittarius bright cloud B, α range $17^h04^m - 17^h42^m$, δ range $-24°$ to $-33°$. This region, centered near $l_{II} \sim 358°$, $b_{II} \sim +7°$, has a patchy, but obviously very heavy extinction (we estimate $A_V \geq 3^m - 4^m$). These TBJ objects are a mixed bag; in the discovery papers, some were tentatively classified as galaxies, some as possible globular clusters, others as planetary nebulæ. During an imaging search for obscured globular clusters, one of us (SGD) obtained images of 14 of them. Out of those, two turned out to be probable globular clusters (TJ 5 and TJ 23), one planetary nebula (TBJ 41), and the rest were obviously galaxies. A dozen of the remaining objects may be classified as galaxies from their appearance on the SRC/I sky survey films. The magnitudes of detected galaxies are typically in the range $R \sim 17^m - 18^m$, within 10 – 20 arcsec apertures (the measurements are difficult and still very preliminary, because of the heavy stellar foreground). The occurrence of so many background galaxies in a relatively small and heavily obscured area is remarkable. These objects must be luminous ellipticals and/or bright S0 or Sp bulges: anything with a lower surface brightness would not be detected through the heavy extinction and foreground. (None of the TBJ galaxies and possible galaxies are detected in the IRAS PSC, which corroborates their identification as early types.) Thus, this concentration of galaxies must be just the very tip of an iceberg. Terzan *et al.* apparently discovered a major rich cluster, hidden behind the Galactic Bulge, in the heart of "zone of avoidance".

Johnston *et al.* (1981) discovered another rich, X-ray cluster, 4U 1708–23, in Ophiuchus, with $l_{II} = 0.5°$, $b_{II} = +9.4°$, at $z = 0.028$ (8400 km/s). Terzan *et al.* noted this, and in an addendum to their paper in *ESO Messenger #42*, remarked on discovery of ***over a hundred*** obscured galaxies in the area near and between the Ophiuchus cluster, and their Sagittarius area.

We obtained long-slit CCD spectra for almost all of the TBJ objects, using the CTIO 4-m, and the LCO 100-inch telescopes, in June and July 1988. CCD images were obtained for all objects using the CTIO 60-inch and LCO 40-inch telescopes in the same runs. Most of the objects are indeed galaxies (about 30 objects; some are uncertain). There are also 4 planetary nebulæ, 1 open cluster, 1 reflection nebula, and 2 or 3 possible globular clusters.

The galaxies span the velocity range $\sim 6500 - 13000$ km/s, with the mean and median redshifts of 8780 and 8610 km/s respectively. There appear to be two concentrations, one near 6800 km/s, and one near 8700 km/s. These results are still preliminary, but seem to confirm existence of a concentration in the redshift range $\sim 7000 - 9000$ km/s.

It thus appears that we are dealing with a massive supercluster almost directly behind the Galactic Bulge, and slightly above the Galactic plane. This Sagittarius–Ophiuchus supercluster may be an important factor in the local supergalactic dynamics, possibly even more massive than the Coma–A1367 system, and at about the same distance.

The full account of this work will be submitted for publication shortly.

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