Minutes of the Ordinary Meeting of the Cape Centre held on 17/10/74 at SAAO at 8 pm

Present were the Chairman Mr K Burke, 27 ~~26~~ members and 4 visitors

Apologies for absence from Bekker, Saville, Semian-off. and Bate.

The November Meet was discussed: It would take the form of an observers meeting with an exhibition of Astro photos by members.

Talk by Dr. John Caldwell: "The Large Scale structure of our Galaxy".

Not easy to decide this from our vantage point due to interstellar blacking-out Observe other galaxies to estimate the shape of our own. 2 main types: Spiral and elliptical. Composed of gas, dust and stars.
Recently declared that there is much more to a galaxy than can be detected by direct observation. The mass distribution of a galaxy is very smooth despite indications by photographs that they end abruptly.
A typical galaxy consists of a disc which contributes ~ 9/10 of the visible portion, a halo which contributes about $\frac{1}{10}$ and a corona which is almost invisible. However the light distribution is not

indicative of the mass distribution
We find the distance of our sun
from the center of the galaxy by various
means eg the distribution of globular
clusters R.R. Lyrae Variables, general
star counts etc and find an
average value of 8,5 K.P.C.
Another way: Velocity measures
mass. The mass becomes known
if you know the velocity.
Thus we calculate the mass of the
galaxy inside the orbit of the Sun
= 1×10^{11} Sun masses.
To find the mass outside the
suns orbit we make use of the escape
velocity of our galaxy which is
550 Kilometers/sec. (No stars of this
speed or higher are known, because
they all escaped some time in the past
We find that the mass beyond our
suns orbit is 1×10^{12} Solar masses
Thus although we are not aware
of it the corona has the greatest
proportion of mass in the galaxy.
The presence of the corona can be
inferred by the "flat" rotation
curve for beyond the suns orbit.
Comparing the velocity dispersion of
Population I vs Population II stars
we find them to be very much the
same.
Another approach: We are a binary
system with M 31 and once
again we use velocity to measure

Mass and find that the combined mass is 3×10^{12} solar masses with a proportion of 2 for M31 and 1 for us. Another proof: We need a corona to stabilise our galaxy i.e. to keep it together.

So what is the corona? It must consist of all matter in the range of ~~low~~ low luminosity stars, planet sized objects, rocks and sand but not gas.

Most of this has been discovered in the last 50 years or 20

Signed as correct.

J F Dean.

N.B. The astronomy discussed here is not yet "proven". JFD.