

X. HIGH-VELOCITY CLOUDS AND THE MAGELLANIC STREAMS

INTRODUCTION TO THE SESSION

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The generic label "high-velocity cloud" is a very unspecific term that tells us only that there are clouds of hydrogen gas moving with velocities which are anomalous for their position on the sky, if we assume that we live in a flat, uniformly rotating galaxy. If one attempts to explain them all away in one fell swoop we might draw an analogy with the situation extant in the 19th century, when optical astronomers were aware of patches of emission that were called nebulae. We now know that there are extragalactic as well as galactic nebulae, all quite different from one another. They were recognized to be so different as soon as the quality of data on these objects improved sufficiently. We may be in a similar, somewhat frustrating, position with regard to the high-velocity clouds. Soon after their discovery in 1963 it was believed that the clouds were mostly at negative velocities and that they were very local. Now we know of many more clouds at both positive and negative velocities. The models proposed for their existence cover a range of distances. We still have local (infall and explosive event) models, while other models place the clouds on relatively nearby spiral arms, in the high- z extension or warp areas of distant arms, in the outskirts and immediate neighborhood of the Galaxy, at the distance of the Magellanic Clouds, and even beyond. There may well be some truth in all of these models.

Even as one strives for the simplest explanation for all the clouds, one should always remain aware that we can already identify several distinctly different phenomena in the data. The clouds near the galactic center have one explanation, those near the south galactic pole appear to be associated with the Magellanic Clouds, while those near the galactic anti-center may manifest yet another phenomenon. While we should strive for the simplest model we should bear in mind that Nature does not necessarily work that way. We should attempt to recognize systematic

differences between clouds in different areas of the sky. This might help in their identification. Hopefully by the end of this century we will have labels for several classes of the high-velocity clouds, in analogy with the progress made in the recognition of optically visible nebulae.