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To: JLOCKMAN
Subj: GB meeting

From: J.N. Bregman

To: P. Vanden Bout, R. Brown, K. Kellerman, G. Seilestad, J. Lockman

Re: Comments on a new telescope

First, my apologies for not being able to attend the meeting.

The area that has been limited greatly by telescope constraints is the structure of galactic hydrogen. Single dish surveys have provided basic information about the distribution of the ISM, but have yielded only limited information about the general structure of the cold ISM. Surveys, such as the Hat Creek survey by Heiles, revealed some "bubbles" and "worms" in the HI, but the amount of information that could be extracted from the data was limited by both spatial resolution and dynamic range. The study of detailed structure in HI both in and out of the plane is greatly limited by sidelobe contamination. Tremendous scientific advances in these areas could be made if the dynamic range of an instrument could be improved by at least an order of magnitude. In addition, one would like to have resolution better than the Hat Creek survey. These scientific goals can be met with a 100 m class dish (or larger) that is designed to minimize the contamination from sidelobes and the like. A point to note is that significant advances have been made in nearly every field when the sensitivity or resolution has been improved by an order of magnitude or greater. This type of improvement is possible for the galactic hydrogen problem.

It is worth noting that ROSAT, a European (and American) X-ray satellite will be make a detailed all sky survey in the soft energy bands (near 100 eV) at a resolution considerably greater than the Wisconsin effort in years past. This type of survey is very sensitive to absorption by neutral gas. With the less detailed soft X-ray surveys of the past, the comparison of HI and X-ray data has played a crucial role in understanding the structure of the local ISM. Analysis of the upcoming X-ray survey in conjunction with better HI data should lead to a much better understanding of the spatial structure of both the hot gas and the neutral gas in the local interstellar medium.