Cosmic Static

Slide	Picture	Comments
1	Jansky Ant., 1931-2, 20.6 mc, 18 hrs ± 30 min RA, −10° ± 30° Dec.	
2	31. ft dish	20 ft focal length 160 mc
3	" "	480 mc equip.
4	Sample 160 mc Traces	1½ hrs wide
5.	Constant intensity contours	
6.	Plane of Galaxy	
7.	Messier 101	
8.	480 mc traces,	25 min wide

Solar Noise

9.	160 mc sun + milkyway	
10.	Sun crosses	"
11.	480 mc sample traces.	
12.	Intensity versus time	

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Solar and Cosmic Radio Waves

BY
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As early as 1894 it was suggested by Oliver Lodge that long wave radiation might be coming from the sky similar to star light and sun light. At that time only relatively crude equipment for the detection of such radiation was available. Many years were to pass and great technical improvements were to be accomplished before apparatus suitable for detecting celestial radio waves became available.

In 1931 K. G. Jansky of the Bell Telephone Laboratories was studying the direction of arrival of terrestrial atmospherics. When no thunder storms were present it was found that his automatic recording equipment showed small residual disturbances. These were ultimately traced down and found to be coming from a variety of directions closely approximating the plane of the Milky Way. Jansky gave the position of 18 hours plus or minus 30 minutes right ascension and minus 10 degrees plus or minus 30 degrees declination as the main source of the celestial radio waves. His work demonstrated the existence of long wave radiation from the sky and gave an approximate indication of the direction of origin. On the basis of this work it was decided that specialized machinery should be built for making a particular investigation of this phenomena. A subject of great interest would be an accurate determination of the exact direction of arrival of these natural long wave radiations.

To carry out this work a parabolic metal dish 31.4 feet in diameter and 20 focal length was constructed on a meridian transit type mounting

at Wheaton, Illinois. Automatic recording equipment was installed and data was taken by means of sweeps along lines constant declination using the rotation of the earth for variation of right ascension. After some 200 charts were secured the data was organized into constant intensity contours. These showed the major maximum at a frequency of 160 Mc/s to be in the direction of Sagittarius. Minor maxima in the directions of Cygnus, Cassiopeia, Canis Major and Puppis were found. The lowest minimum was in the direction of Perseus. Then the data was repletted using only those intensities measured along the galactic equator. This gave a presentation in polar coordinates of intensity versus galactic longitude at zero galactic latitude. The resultant figure was shown to have a vague similarity to that of messier 101. A few sample traces taken at 480 Mc/s demonstrated that the phenomena existed in somewhat attenuated form and the radiation clustered more closely to the plane of the galaxy than at 160 Mc/s.

The radiation from the sun was first detected at a frequency of 160 Mc/s in 1943 and a variety of traces obtained over several months as the sun gradually passed through the plane of the Milky Way in the region of Sagittarius. Later traces of solar radiation obtained at 480 Mc/s showed that during the 1947 and 1947 the sun was in a much more disturbed condition than in 1943. A number of these traces exhibited anomalies which indicated that temporary bursts of solar radiation occurred at intensities from several hundred to a few thousand times the intensity observed during the quiet solar day. Solar intensity measured at true noon at Wheaton, Illinois was plotted daily for about a year. Besides the bursts of radiation it was found that the background solar intensity was abnormally high on days in

the spring of 1947 when a large cluster of spots was near the central meridian of the sun.

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